AMERICAN DENTAL ASSOCIATION

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Dental Abstracts

. . . . a selection of world dental literature

Lon W. Morrey, D.D.S., editor
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AMERICAN DENTAL ASSOCIATION

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1. To present a selection of pertinent literature representative of all points of view within the profession;

2. To provide, by a few hours' reading each month, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and

3. To supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.

The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of modern knowledge in the various specialties. Articles from which abstracts have been made are on file in the Library of the American Dental Association and may be borrowed by members of the Association. Requests for articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Only three articles may be borrowed at one time, and they may not be kept longer than one week. No charge is made to Association members for this service.

Orthodontics and pedodontics

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Orthodontics

Musical wind instruments utilized in orthodontics (Orthodontie et instruments de musique à vent)

J. E. Heskia and L. Hospital. *Ann.odontostomat., Lyons* 12:301-310 Nov.-Dec. 1955

When orthodontic treatment requires the strengthening of the lip and mouth muscles, the utilization of musical wind instruments is recommended. The mouthpieces of some of them are well suited to achieve the desired exercise.

Four groups of wind instruments can be used for this purpose: (1) those with cup-shaped tubular mouthpieces such as the trumpet or other brass instruments in which the tone is produced by vibrations of the player's lips; (2) those with a single (globular) reed such as the clarinet or the saxophone; (3) those with double reeds such as the oboe, the bassoon or the English horn, and (4) those which are blown through a lateral hole such as the flute or the piccolo.

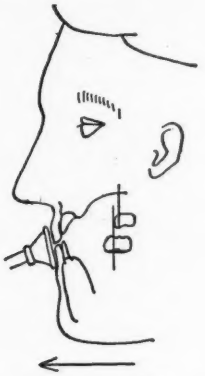
The trumpet is especially well suited for preventive orthodontic therapy (in prognathism) and for subsequent treatments.

In instances of distoclusion, a correction can be obtained by strong tractional forces such as are used when brass instruments, the oboe or the flute are blown.

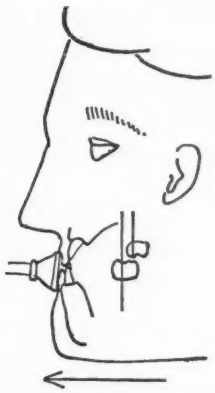
Many other irregularities of the teeth and even some types of malocclusion will be improved when the patients exercise regularly by blowing wind instruments.

The parallel orthodontic treatment will be easier and more effective.

The acceptance of this unusual proposal will not only bring success in selected instances but also will promote better cooperation between orthodontist and patients, especially those of the younger generation, and will make orthodontic treatments less uncomfortable.

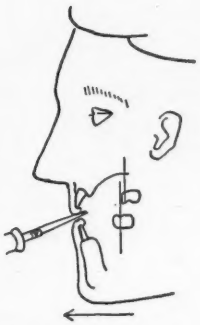


Trumpet mouthpiece



Trombone mouthpiece

Clarinet mouthpiece



Bassoon mouthpiece

Saxaphone mouthpiece

The importance of the dental condition for players of wind instruments

(Die Bedeutung des Gebisses für Blasmusiker)

S. Seidner, Tel-Aviv, Israel. *Zahnärztl.Rundsch.* 65:58-61 Feb. 5, 1956

At the Vienna State Academy, several hundred wind instrument players were examined to establish the importance of the dental condition for the playing of various types of wind instruments. The relation between the jaws, the position of the upper and lower anterior teeth, the condition and shape of the lips, the tongue and the palate were studied. Conclusions were reached as to which type of wind instrument was best suited to each individual player.

Roentgenograms of the jaws were taken before and during the blowing of high and low tones. The pressure exerted by the mouthpieces on lips, teeth and jaws were measured, and the player's lungs, the stomach and the intestines were examined. The roentgenograms taken during the actual blowing revealed excellent information regarding the relation between the jaws and the function of all oral parts involved.

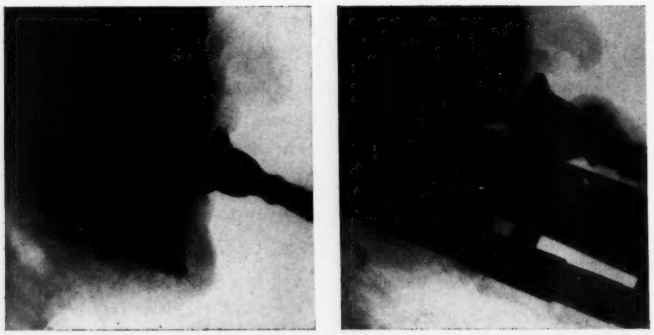
Surprisingly, it was established that the presence of Angle's Class III malocclusion favors the adjustment of the player's mouth to the mouthpieces of oboe and bassoon. Persons with Angle's Class II malocclusion or those whose upper arch is narrow or whose palate is extremely high (without symptoms of Angle's Class II malocclusion) are especially well suited to blow the clarinet.

The condition of an edge-to-edge bite makes persons well adapted for blowing the trumpet, the English horn, the trombone or the tuba.

For achieving clear, beautiful and resonant tones, the relation between the jaws, the condition of the dentition, the resonance of the palate, the adaptability of all parts of the oral cavity, the sinuses and the pharynx are decisive factors, in addition to the musician's individual ability, talent, intelligence and musical feeling.

A delicate and highly sensitive tongue with a fine tip is especially important for producing the staccato.

During the examinations, no instance was found in which wearing of artificial dentures prevented nonprofessional musicians from playing the various types of wind instruments. The blowing of brass wind instruments such as trumpet, horn, trombone and tuba, however, is compli-



Position of the mouthpiece of a trumpet (left) and trombone (right)

Position of the mouthpiece of a clarinet

Position of the mouthpiece of a flute

Left: Position of the mouthpiece of an oboe

Right: Position of the mouthpiece of an English trombone

cated when the artificial dentures are not perfectly fitted, because the constant pressure of the mouthpieces exerted on the dentures is extremely strong. Therefore, exceptional stability of the dentures is required.

Insertion of artificial dentures frequently is necessitated after a person has reached the age of 50, at a time, therefore, when the artistic quality of a musician begins to decline. In many instances, the physiologic insecurity caused by the new dentures, and not the dentures themselves, may produce a decrease of tone volume and quality. The trumpet and the horn are especially sensitive instruments, and it is difficult to obtain clear high notes or an excellent pianissimo, and, therefore, it seems hardly possible for a leading musician to play in a first-rate orchestra to the full satisfaction of both the conductor and the audience even with perfectly fitting dentures. A musician is an artist, and his most important prerequisite is talent. Some wind instrument players did rather well in spite of their artificial dentures because of their outstanding musical talent. But, nevertheless, they might have been still better had they been in full possession of their physical attributes.

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Pedodontics

Dentistry for children—our responsibility

Arthur A. Dugoni. *Arizona D.J.* 2:62-66
June 1956

Dentistry can best meet its responsibility by devoting an increasingly larger part of dental service to children. This is the most realistic field for preventive dentistry.

More dentists are afraid of children than children are afraid of dentists; yet the ability to control children is not the endowment of a chosen few. It is a combination of positive psychology, voice control, suggestion and common sense applied with confidence.

The development of higher speeds and better equipment is changing the concepts of practice management. It is becoming common for quadrant dentistry to be performed; in many instances work on a full arch is completed in one appointment. With such multiple restorations, the problem of patient control becomes important. The easiest, simplest and most efficient method of isolating a quadrant of the mouth is through the use of the rubber dam. The rubber dam affords cleanliness, sanitation and protection to the patient and operator; it provides excellent visibility, a dry field, comfort to the patient, and prevents him from aspirating or swallowing foreign bodies.

The pre-punched rubber dam as described by Tocchini (1953) is the most efficient. To increase the resistance of silver amalgam restorations to fracture, the cavity should be prepared with a wide isthmus, a rounded and sloping pulpal wall and proximal retention grooves.

Silver amalgam is the restoration of choice in the majority of operative procedures on the child. Routine use of an alloy that meets the specifications of the Council on Dental Research of the American Dental Association is a simple safeguard.

Multiple restorations in children can best be attained with a matrix that will maintain its position during the entire period of condensation and preliminary carving, and that can be adapted to several teeth at one time. This can be accomplished with individually constructed, spot welded matrix bands. Bands that have been prepared in advance permit the best speed and efficiency. With a little experience the correct band can be selected, contoured and fitted to the tooth in a matter of seconds. After the band is fitted to the tooth or teeth, it must be wedged, and the internal surfaces of the band must be contoured with a cylindrical burnisher.

All amalgam restorations should be overbuilt by 1 mm. or more, because the top portion is never so well condensed as the part underneath. When the restoration is carved back to the proper contour, it will leave the condensed amalgam on the surface of the finished restoration. The spot welded band can be removed easily with a right angle scissors no. 51.

Even well condensed amalgam fillings will corrode if they are not smooth at the margins and polished. A well polished restoration is an aid in preventing the recurrence of decay, discoloration and corrosion, and is more comfortable to the patient.

The taking of roentgenograms in children
(Sobre la toma de radiografias en niños)

Samuel Leyt. *Rev.A.odont.Argentina* 44:233-240
June 1956

No dental examination is complete without roentgenograms, and any plan of treatment based only on clinical inspection may lead to many disagreeable surprises. This applies not only to adults but also to children.

Children, especially the very young, fear and resist the x-ray machine. It is necessary, therefore, to present this new experience to each child slowly and step by step.

First the child is shown the machine itself. It should be remembered that inanimate objects possess, for the child, human qualities. He may resist the dentist and his equipment because of his parents' and friends' comments on their previous visits to a dental office.

The machine and the taking of a roentgenogram should be explained, and the child should

be requested to repeat the given explanation. The first exposure should be an occlusal view of the upper anterior teeth. This, followed by an occlusal view of the lower anterior teeth, makes an easy initiation for the child patient. Afterwards the usual periapical and bitewing exposures are taken.

Some children may cough or gag on introduction of the film. To avoid any difficulty, it is advisable to give the child a film and request that he, aided by his mother, practice its insertion at home. The exposures can then be taken at the next session.

To arrive at a diagnosis and plan a treatment correctly, it is necessary to correlate the chronological, dental and skeletal ages of the young patient. This latter can be learned from a roentgenogram of the child's carpal bones.

When the dentist himself thoroughly understands the need for systematic roentgenographic examination, he usually can gain the parents' consent for the procedure. But if this were not obtainable, it would be correct and a sound investment for the dentist to take the roentgenograms at his own expense.

Roentgen rays in the practice of pedodontics (Los rayos X en la practica de la odontologia infantil)

Manuel Gutverg Z. *Rev.A.D.Mexicana* 12:308-312 Nov.-Dec. 1955

The first step in treatment planning must be the acquisition of sufficient information to establish a correct diagnosis. In dentistry the roentgenogram gives 50 per cent of the required information.

The need to study tooth and periodontal tissues not visible to the naked eye can be understood if it is remembered that the engineer must dive below the surface of the water to know the exact constitution, situation, condition and strength of a pier. What is above the water line, or the gingival line, is only half the story.

In pedodontics the roentgenogram is especially important as it permits the study of as many as 52 teeth. Besides looking for dental decay the dentist must seek for anomalies in number, development, position and calcification, and for evidence of root resorption and apical pathologic conditions.

To complete a study of this nature it is advisable to use the different types of films: periapical, bitewing, occlusal and extraoral.

The periapical roentgenogram will disclose the tooth position, root resorption of deciduous teeth and apical foramen of permanent teeth, the condition of the alveolar bone, and the existence of dental decay.

The bitewing roentgenogram shows cavities and their depth, the occlusal and incisal relationship of opposing teeth, the loss of space due to early extractions, and the proximal surfaces of fillings.

An occlusal view discloses the relationship of an impacted tooth, supernumerary or otherwise, with its neighbors and the labial and lingual surfaces of the alveolar process.

In an extraoral roentgenogram it is possible to study the configuration of soft tissues and lips, their relation to the underlying bone, and the position of the condyle in its temporal fossa, and to investigate the cause of a trismus.

With adequate charts and a study of the carpal bones of the child's hand as pictured in a roentgenogram it is possible to determine whether bone development and age correspond. This knowledge, supplemented by results of calcium and phosphorus blood tests, can indicate the presence and intensity of rickets.

The roentgenogram is important when an early extraction of a deciduous tooth is indicated, indispensable before, during and after endodontic treatment, and important in the diagnosis of periodontosis and the condition of the periodontium subsequent to treatment.

The roentgenogram, therefore, is indispensable to all dentists, but it is especially so to the pedodontist.

Armamentarium

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Instruments

The "Aerognathodilatator"

(Aerognathodilatator nach Kallay)

Juray Kallay, Zagreb, Yugoslavia. *Österr.Zschr. Stomat.* 52:646-647 Dec. 1955

The dilation instruments, frequently used in dental practice when ankylosis of the temporomandibular joint is present, have the following disadvantages: (1) they prevent undisturbed impression taking; (2) they exert extreme stress on the teeth involved which often leads to trauma, and (3) they tax the patient's endurance to the utmost.

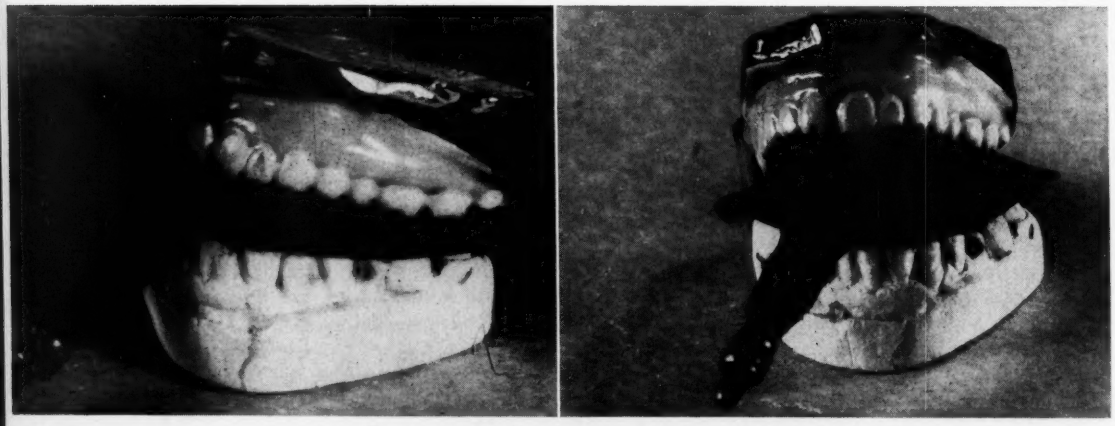
The author has designed a new instrument, the Aerognathodilatator, which permits opening of the mouth without any of these disadvantages. The apparatus can be inserted between abnormally immobilized teeth, and the dilating can begin almost immediately.

The Aerognathodilatator consists of a rubber balloon in the shape of the dental arch. The balloon can be inserted easily between the tooth rows. A valve contrivance permits inflation with a simple hand pump. The dilation continues slowly and steadily for several days; each day the rubber balloon is inflated a little more until the opening permits irradiation with infrared lamps, short waves, microwaves or diathermy.

The main advantage of the new apparatus lies in the fact that it can be applied not only when ankylosis of the temporomandibular joint is present but also when acute arthritis disturbs the mobility of the joint.

Treatment with the Aerognathodilatator varies according to the condition in each individual patient and lasts for from two weeks to several months. The longer the apparatus is worn, the sooner complete success is achieved, and the more secure is the result.

The Aerognathodilatator can be constructed by the vulcanizing process at little cost.



Left: The Aerognathodilatator inserted but not inflated. Right: Inflated

After treatment has improved the condition by obtaining the desired mobility of the joint, small wooden plates are inserted between the tooth rows, and the apparatus positioned between these plates.

In edentulous mouths, this instrument can be employed successfully after suitable imbeddings are inserted to protect the edentulous regions.

A simple and practical instrument for observing x-ray films (Ein einfacher und praktischer Röntgenfilm-Betrachter)

Werner Hielscher. *Deut.Zahnärztebl.* 10:243-244 April 8, 1956

In the observation and evaluation of x-ray films and roentgenograms it is necessary to use strong magnifying glasses. To simplify this procedure, a new apparatus for the direct observation of x-ray films has been introduced recently. This instrument is being used in many German dental clinics and in general practices.

The apparatus consists of: (1) a circular mirror to which a strong reflector is attached; (2) a holder for x-ray films and roentgenograms, and (3) a holder of exchangeable magnifying glasses.

For general dental practice, this instrument has the following advantages: (1) wet x-ray films can be observed and evaluated immediately; (2) the reflector permits constant observation of the roentgenograms during surgical procedures; (3) even the smallest source of light is sufficient to permit clear observation, and (4) overexposed and underexposed films are clearly visible without retouching.

Broaches with nylon handles (Nervennadels mit Nylon Griffen)

Walter Bönigk. *Dent.Echo* 26:100 June 1956

Many accidents occurring in endodontic practice can be avoided by care and patience. Slender spiral drills and barbed broaches should always be tested for weak spots before they are used. Imperfect instruments should be discarded.

When an instrument is broken, it often becomes lodged and the fragments are difficult to remove. Sometimes, such fragments are swallowed by the patient. Nothing is more annoying to the dentist than the discovery that he has broken an instrument during root canal preparation.

To prevent such occurrences, which can lead to severe complications, a new type of broach handle, to be used with broaches and root canal files, has been introduced.

The handles are made of elastic nylon, and are designed to make instrument manipulation easier in both root canal preparation and pulp treatment. The elasticity of these handles ensures reaching of carious lesions and root canals. The use of broaches to which this type of handle is attached enhances the safety of operative work in the patient's mouth. The instruments with their nylon handles can be boiled or sterilized in any chemical solution.

Several broaches may be kept sterilized and ready for use, to eliminate troublesome instrument changes.

▼ Therapeutics

Control of edema, pain and trismus in oral surgery with an oral antihistamine

Joseph J. Blinderman. *New York J.Den.* 26:231-233 June-July 1956

Two groups of ambulatory patients seen mainly in the oral surgery clinic in the New York Polyclinic Medical School and Hospital received an antihistamine compound, promethazine hydrochloride, in 12.5 mg. tablets.

The first group comprised 50 patients, 20 to 55 years old, in need of various types of oral surgery. A half hour before the operation, each received two tablets of promethazine hydrochloride (total dose, 25 mg.) and two tablets of mephentermine sulfate (total dose, 25 mg.) immediately after injection of the local anesthetic, to counteract the soporific effect of the antihistamine. No antibiotics or salicylates were administered. Ninety-four per cent of the patients recovered uneventfully; 6 per cent experienced postoperative symptoms. In one, slight swelling occurred after extraction of a third molar, and two had slight swelling and slight pain after apicoectomy.

The second group consisted of 100 patients, 20 to 60 years old, who required a variety of dental procedures of about the same severity as the first group. For these patients the dose was reduced to one tablet (12.5 mg.) of promethazine hydrochloride and one tablet (12.5 mg.) of mephentermine sulfate. On the smaller dosage, 96 per cent

had an uneventful recovery, and 4 per cent suffered postoperative complications. Four patients had slight postoperative swelling only—two after extractions of third molars and two after multiple simple extractions.

No untoward side reactions were observed. The sedative effect of the antihistamine was counteracted by the mephentermine sulfate.

For prophylaxis of postoperative complications in dental surgery, the same good results may be obtained with oral promethazine hydrochloride as with injections of antihistamine. Edema, pain and trismus may be eliminated entirely or reduced to a negligible degree by preoperative oral medication with promethazine hydrochloride. The effective minimum dose is 12.5 mg.

Experimental and clinical investigations of the relation between fluoride intake and thyroid function (Ricerche sperimentali e cliniche sui rapporti tra fluoro e tiroide)

A. Benagiano and S. Fiorentini.
Ann.stomat.,Roma 4:275-292 Aug. 1955

The staff of the dental department of the George Eastman Institute in Rome, Italy, investigated the possible relation between sodium fluoride intake and thyroid function in animals and in patients afflicted with dental fluorosis. The animals (different members of the rodent family) were poisoned by a daily dose of 2 mg. sodium fluoride for each kilogram of body weight.

The investigations revealed that fluorides can produce considerable anatomic and functional changes in the thyroid glands but only under certain conditions, such as when the action of the fluorides is prolonged for a period inversely proportional to the strength of the dose applied. When the dose is below the toxic level, functional changes can hardly be produced. When the doses are minimal, the latent period before fluorine toxication varies and little change in thyroid function occurs. When functional changes caused by larger doses occur, they are manifested by an increased function and an altered thyroidohypophysial metabolism. When an increased and prolonged medication of sodium fluoride is applied, it may lead to parenchymatous hypertrophy and to hypofunction of the thyroid glands, and finally to a strumiform degeneration of these glands.

Some new drugs in dentistry

H. E. Young. *J.California D.A.& Nevada D.Soc.* 32:307-310 July-Aug. 1956

Three groups of relatively new drugs are reviewed. All have been investigated as to their toxicity and have been proved safe if administered properly. The value of each is currently being ascertained in the dental field by clinical investigation, to determine if it has a place in the armamentarium in dentistry.

In the first group of drugs are the so-called "tranquilizing" drugs that attempt to promote relaxation and decrease tension. Chlorpromazine was the subject of a report in the dental field which emphasized its tranquilizing and antinauseant effect. It has a depressant effect on the central nervous system and a mild antispasmodic, antihistaminic and adrenalytic effect. It potentiates hypnotics, sedatives, narcotics and anesthetics one fourth to one third. In prolonged use it has been known to produce obstructive jaundice and, with high doses, hypotension. It should be considered for further use in dentistry. Meprobamate differs from chlorpromazine in that it is relatively ineffective as an antinauseant and apparently is without side effects. Action is primarily that of an interneural blocking agent. Skeletal muscles are relaxed as are higher centers in the brain. Meprobamate seems especially effective in anxiety states. Further clinical investigation in the dental field will be necessary to evaluate its action. Present inconclusive experience indicates that a single dose of a 400 mg. tablet given two hours preoperatively is effective in reducing tension for operative procedures using local anesthesia.

Two drugs have shown promise as hemostatics. Carbazochrome (Adrenochrome) apparently restricts itself to maintaining the tonicity of the intracellular substance of capillary walls so that plasma and red blood cells will not escape during periods of trauma. It has no toxic reactions. Carbazochrome has been found to be generally

effective in exodontics as well as in oral surgery. The drug may be administered either orally or parenterally.

The conjugated estrogen compound (Premarin), another hemostatic drug, is packaged in vials of 20 mg. which represents a single adult dose, to be injected intravenously slowly. One vial injected for mass oral hemorrhage under general anesthesia has been effective in 19 instances and an apparent failure in but one. Without question, the estrogens need much further clinical investigation and physiologic analysis.

Last of the three drug groups to be considered are the anti-inflammatory or anti-edema agents. Streptokinase-streptodornase is a purified and concentrated group of enzymes produced by certain strains of streptococcus. It has come under clinical trial in mass traumatic facial injuries, and in lessening postoperative edema caused by surgical insult to the tissue. The normal dose is 5,000 units of streptokinase, combined with 1,250 units of streptodornase, given by deep intramuscular injection, and accompanied by adequate antibiotic therapy. These enzymes are antigenic; should a sensitivity reaction develop in a patient, their use should be discontinued immediately and the usual regimen for allergic manifestation be initiated promptly.

Hyaluronidase is a drug effective against edema in localized regions. It is injected directly into the specific region. Hyaluronidase is prepared in vials of 150 and 1,500 TRU (turbidity reducing units). It should be withdrawn with an inch long 20 to 23 gauge needle and Luer syringe and injected into the predetermined tissues with vigor. The amount per injection varies.

Chlorpromazine hydrochloride as an antinauseant and tranquilizing agent —a preliminary report

H. E. Young and B. C. Kingsbury, Jr. *J.Oral Surg.* 14:212-215 July 1956

The value of chlorpromazine hydrochloride in the control of nausea and vomiting, for mental and emotional disturbances, and in the treatment of alcoholism, intractable pain and hiccups has been widely reported in the medical literature. The adaptation of chlorpromazine to office anesthesia in dental and oral surgery has not been generally reported.

Chlorpromazine was tested clinically with two selected groups to ascertain its possible value as an antinauseant and tranquilizing agent for dental and oral surgery when general anesthesia was used.

Its tranquilizing effect observed in 67 children was demonstrated sufficiently to warrant its further investigation and use. Although 10 mg. was the standard dose for children three to nine years of age, older and larger children tolerated doses of 20 mg. without adverse reactions.

Chlorpromazine was administered to 29 patients as an antinauseant. Its rapid action was superior to that of any previous agents used. No toxicities or side reactions were observed in any of the patients.

Moniliasis treated with Pentamidine

(Moniliasis tratadas con pentamidinas)

Aksel Stenderup, Flemming Kissmeyer-Nielsen and Jorgen Bichel. *Fol.clin.internac., Barcelona* 4:149-151 April 1956

Wolff and others recently (1955) reported that two patients with moniliasis of the esophagus were successfully treated with hydroxystilbamidine, a diamidine.

Experience *in vitro* demonstrated that at low concentrations both stilbamidine and Pentamidine frequently inhibit the growth of *Candida albicans.*

Chronic malignancy predisposes to *C. albicans* infections. Three such patients, one with chronic myelogenic leukemia, and two with Hodgkin's disease, were treated with Pentamidine. The dosage was 200 mg., intramuscular, given one or more times a day in accordance with intensity and resistance of infection.

The favorable results obtained with Pentamidine, added to Wolff's results with hydroxystilbamidine, justify the conclusion that the diamidines are useful in the treatment of moniliasis. Wolff's quicker results may be due to the intravenous application, or to the greater effectiveness of hydroxystilbamidine on *C. albicans* as compared to Pentamidine.

Materials

Comparative study of acrylic and porcelain jacket crowns

(Estudio comparativo entre las coronas fundas de acrilico y de porcelana)

Jesus Lastra Martinez. *Rev.A.D.Mexicana* 12:293-297 Nov.-Dec. 1955

There is no material that can compare esthetically with porcelain, when beauty of form and harmony of colors are desired in dental restorations.

Porcelain's most remarkable qualities are low thermal conductivity, ability to obtain all shades of color, transparency similar to normal dental tissues, everlasting vitreous surface that does not permit an accumulation of tartar or bacterial plaques, resistance to acids formed in the mouth, perfect compatibility with soft tissues, and imperviousness to all oral fluids.

These advantages, however, are offset by its complicated manipulation, which demands great ability and extreme artistic skill. This has led many operators to use acrylic resin.

According to Tylman, resin for dental purposes must possess tenacity, resistance to flexure and tension, low cold flow, resistance to water and solvents and minimum dimensional changes, and it must be relatively hard and easy to mold, and adaptable to a simple and inexpensive technic.

Though no resin fully meets these qualifications, the acrylic resins possess them to a degree that permits their use in dentistry.

It would appear that 5 per cent of the acrylic resin, in the usual dental laboratory technic, does not polymerize but remains trapped as bubbles that weaken the material, alter light refraction and color, and allow absorption of fluids. The acrylic resin is not dimensionally stable because it absorbs up to 3 per cent water, and because it tends to release strains after being freed from the heat and pressure under which it was cured. Its surface is easily scratched and attacked slightly by alcohol and some anesthetics. As it can irritate the mucous membrane, it produces gingivitis when the jacket crown is in direct contact with the gingiva.

Though some authors highly recommend acrylic resin for jacket crowns, it is sound practice to limit its use to shoulderless crowns on young teeth and to temporary crowns.

Miscellaneous

Sterilization of instruments and drug solutions (Sterilisation von Instrumenten und Medikamenten)

G. Roemer. *Medizinische* 4:859-865 Dec. 23, 1955

Sterilizers with live steam at an atmospheric pressure require a temperature of at least 170° C. After this temperature has been reached, the sterilizing action should last not less than 30 minutes.

Sterilizers using static hot air require a temperature of from 180° to 200° C., and a sterilization time of at least one hour.

Sterilization in autoclaves necessitates a pressure steam at a temperature of 120° C., and a degermination time of 15 minutes.

With intensive steam, a quick germicidal effect is obtainable at a temperature of 134° C.

All medicinal agents and substances, especially all solutions for injection, must be kept absolutely sterile. Preparations which do not tolerate temperatures above 60° C. should be degerminated by aseptic preparations or by using chemical solutions containing phenol (0.5 per cent), tricresol (0.5 per cent), chloroform (0.1 per cent) and sodium hypochlorite (0.1 per cent).

Sterilization in a bacteriologic sense cannot be obtained by filtration. Also the practice of heating instruments over an open flame for short periods of time is an unreliable method of disinfection.

Chemical sterilization, although safe and practical for instruments, does not destroy the bacteria spores.

Sterilization by freezing methods (in vacuum) preserves the effectiveness of most drugs but does not reach all of the contaminated areas; the freezing methods, therefore, are not reliable.

Periodontics and endodontics

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Endodontics

Treatment of deep coronal fractures of permanent anterior teeth

(Die Versorgung tiefer Kronenfrakturen an bleibenden Frontzähnen)

H. F. Overdiek. *Zahnärztl.Welt* 11:56-57
Feb. 10, 1956

Treatment of minor traumatic injury to the crowns of deciduous and permanent teeth seldom is difficult. Deep coronal fractures, however, are accompanied frequently by "dentin wounds" and pulp exposure. In such instances, favorable results have been obtained by covering pulp and dentin wounds with preparations containing calcium hydroxide. The coverings are kept in position by copper rings. It is necessary to keep the pulp vital and the development of the roots undisturbed.

If no complications arise, the first application should be maintained for from three to six months. An examination will then reveal whether the pulp has remained vital. If the vitality has been preserved, a second calcium hydroxide solution should be applied and kept in position for an additional three months.

Esthetic considerations then can be taken into account, and the copper rings can be replaced by acrylic crowns.

The preparation of the fractured permanent anterior tooth consists of the removal of superficial enamel layers, and undercutting. The subgingival parts should be utilized as much as possible to permit the acrylic crown to remain in position.

After roentgenograms establish that root development is complete, the temporary crown can be replaced by a final restoration.

Such conservative treatment is especially recommended in instances in which the exposure of the pulp is not too severe and no pulp infection is present. In more severe instances, however, pulpotomy is preferable.

When the fracture is the result of a minor traumatic episode and involves the enamel of the tooth only, pain and extensive damage to soft tissue seldom occur. The "chipped" tooth often

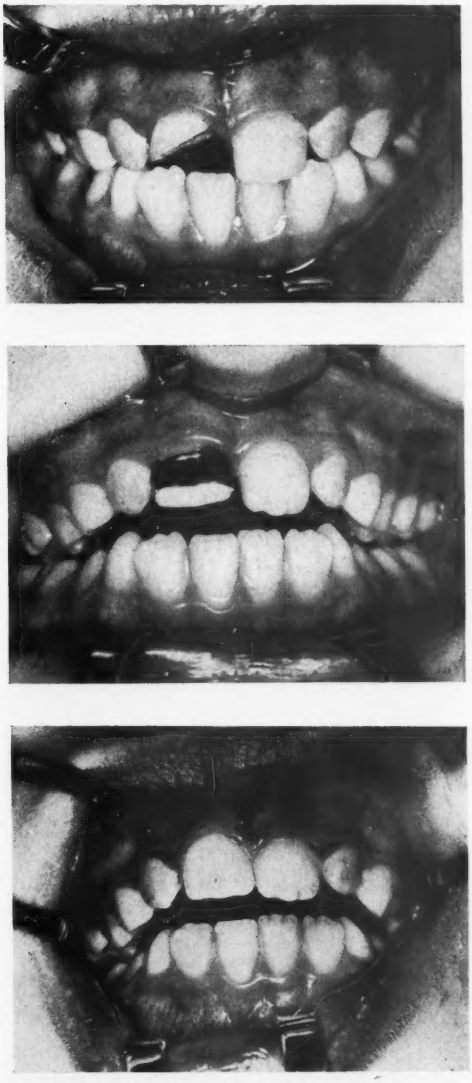

Figure 1 Above: Deep coronal fracture of a permanent central incisor with pulp exposure. Center: Application of a calcium hydroxide solution, kept in position by a small copper ring. Below: After treatment

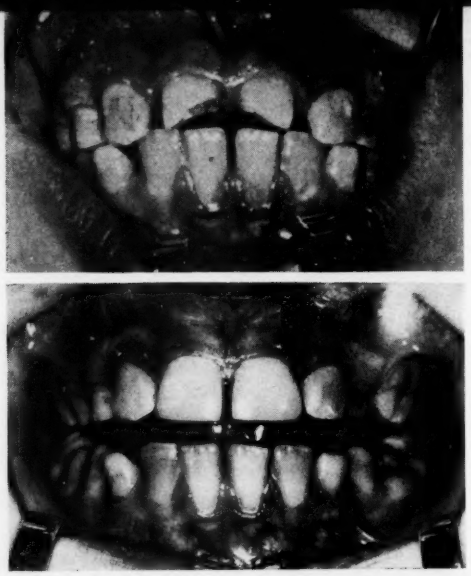

Figure 2 Above: Deep coronal fractures of both permanent central incisors with pulp exposure. Below: Ten months later, the pulp remains vital and temporary restoration is obtained with acrylic crowns

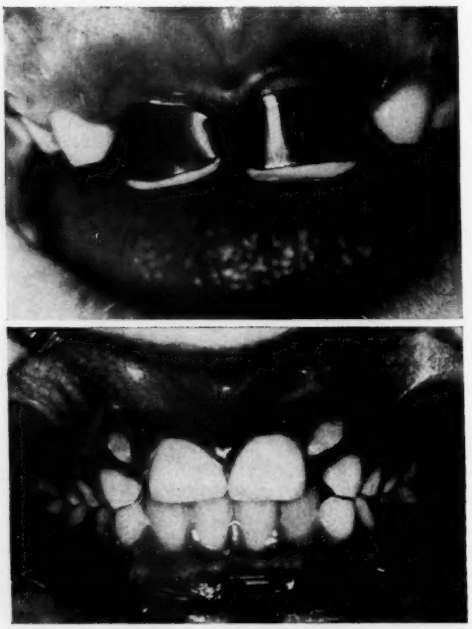

Figure 3 Above: Deep coronal fracture of both permanent central incisors with severe pulp exposure; calcium hydroxide solution is kept in position by large copper rings. Below: Ten months later, the pulp remains vital and temporary restoration is obtained with acrylic crowns

can be treated in one visit. The exposed enamel is desensitized with a low strength phenol solution, and the entire region protected with cavity varnish. Rough margins of the tooth structure are gently smoothed with disks.

Periodic roentgenographic examinations are necessary because even minor blows may cause severe complications in or even death of the pulp.

In most instances of coronal fractures of permanent anterior teeth, the prognosis is favorable and damage to the esthetic appearance insignificant.

A discussion on cultures in endodontics

Seymour Oliet. *Alpha Omegan* 50:110-112 Sept. 1956

In 1953 the World Conference on Endodontics, meeting at the University of Pennsylvania, adopted 21 statements on endodontics, of which no. 16 asserted: "Inasmuch as the primary objective of endodontic treatment is the elimination of microorganisms from the root canal, adequate bacteriologic control is necessary. The culture method is preferable as it is more sensitive than the smear."

Yet few practicing dentists incorporate this procedure in their treatment. The culture method is only an aid and guide to the operator. It is not an absolute method of indicating when to fill a canal. A positive culture is a contraindication for filling a root canal, whereas a negative culture is only one of many indications that the possibility of filling a root canal exists. The culture method helps to reduce the "overhead in time" involved in endodontic treatment. The culture technic is simple and easy and should be used routinely. The following method is proposed:

1. The rubber dam is applied and the involved tooth isolated.

2. The operating field is sterilized with untinted nitromersol (1:200) followed by alcohol (70 per cent).

3. The temporary filling placed at the preceding treatment is removed aseptically.

4. The absorbent point left in the root canal is removed with a sterile barbed broach.

5. The canal walls are wiped with sterile absorbent points to remove as much as possible of

the previously applied medicament. The canals are flushed with a sterile solution which will not retard bacterial growth in a culture medium.

6. The canal walls are freshened by additional instrumentation to remove any remaining medicament.

7. A sterile absorbent point is inserted into the root canal as far as possible and allowed to remain for 60 seconds.

8. The absorbent point is removed with sterile cotton pliers, checked to see that its tip is moist, and inserted into a test tube containing brain-heart infusion broth or glucose-ascites broth. The tube lip is flamed before and after insertion of the absorbent point.

9. Incubation is maintained for a minimum of 48 hours at 37.5° C. The medium is then examined for growth (indicated by the presence of turbidity).

Culture supplies are available commercially. Incubators can be constructed easily and cheaply. Taking cultures is valuable biologically, psychologically and economically.

▼ Periodontics

Periodontal diseases and tuberculosis
(Parodontolyses et tuberculose)

W. Jian, Algiers. *Parodontol.,Zürich* 10:66-69 June 1956

Except for tuberculosis of the tongue, tuberculosis of the oral cavity is comparatively rare. When it occurs, the gingiva and the soft palate usually are affected. These tuberculous symptoms, however, are nearly always secondary to pulmonary tuberculosis.

It can be assumed that pulmonary tuberculosis, especially in adults, upsets the equilibrium of the entire organism and may promote periodontal disease.

Although the conditions observed in which secondary symptoms in the oral cavity had been caused by pulmonary tuberculosis were not more severe than in patients in whom no tuberculous infection was present, the various inflammatory manifestations in the periodontium which accompanied several instances of localized pulmonary tuberculosis seemed to be of great importance.

When patients afflicted with pulmonary tuberculosis are brought to sanatoriums where they receive open-air treatment, this change in environment often reduces aggravating factors of periodontal disease such as inadequate oral hygiene, reduced vitality and nutritional deficiency. This change in environment may increase resistance to infection and thereby diminish susceptibility to inflammation of the periodontal tissue.

The relation which unquestionably exists between tuberculosis and periodontal diseases should influence physicians treating patients who are afflicted with pulmonary tuberculosis to contact a dentist for a thorough examination of the patient's oral condition.

Hereditary factors in periodontal diseases
(Fattori costituzionali ereditari nelle parodontopatie)

Mario Giancotti. *Ann.stomat., Roma* 5:117-122 March-April 1956

At the George Eastman Dental Institute in Rome, Italy, 1,120 patients with periodontal diseases have been examined and their case histories studied. The aim of this investigation was to determine whether special tendencies to periodontal diseases exist in certain patients and whether these tendencies are caused by immediate or mediate hereditary factors.

In 62 per cent of the patients examined, either immediate or mediate causative hereditary factors have been established.

It is recommended, therefore, that before treatment of periodontal diseases is planned, it is necessary to investigate thoroughly the past history of the patient's family (parents and grandparents) for phenomena of those diseases. Only in such a manner will it be possible to control or eliminate all dysfunctional, irritative and systemic factors in the patient's condition.

The high percentage of hereditary factors should call to the patient's attention the necessity for periodic examination of his children's dentition to ameliorate periodontal diseases caused by immediate and mediate hereditary factors.

Prosthetic dentistry

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Complete dentures

A new flask used in construction of acrylic resin dentures

(Küvette zum Gebrauch bei der Herstellung von Dentalprothesen aus Kunststoff)

Edwin Zills. *Dental Labor, Wiesbaden* 4:19 Jan. 1956

Christian Roar Jacobsen, a Danish dentist, has developed a new flask which can be used successfully in the construction of acrylic dentures.

This flask consists of two cone-shaped rings, uneven in height. After the mold has been filled (or preferably, slightly overfilled), a better closure is obtained by guiding rods attached to both rings. Rings and guiding rods are made of light metal. Both halves of the flasks have removable covers, and the correct placement of the denture in the desired position is achieved by grooves.

Several dentures, from different impressions of the same model and interchangeable on all the dies and the master model, can be made. The flask can be processed by both the slow rising high-heat and the constant low-heat technics.

The complete closure of this flask should be made when the acrylic material is between 70° and 90° C. (158° to 194° F.). At this temperature, the acrylic resin is most fluid and plastic.

When this type of flask is used, subsequent disturbances or displacements of the molecular structure is avoided, and no distortion or misfit of the acrylic resin denture will occur.

Shrinkage, usually occurring during the processing of acrylic material, is almost eliminated. The utilization of this flask in forcing additional material into the hot mold while the enclosed polymerized resin still is plastic, also eliminates shrinkage and decreases the strain within the denture.

Porosity, which usually develops during the processing of unusually thick prostheses, is also eliminated by the perfect polymerization obtained, which, even though rapid, begins in the outer surface and progresses toward the center.

Clinical experience with the new flask indicates that the processed acrylic resin will acquire the toughness necessary to resist all impacts.

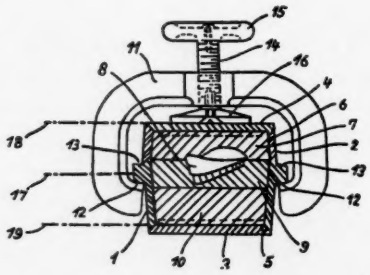

Figure 1 Jacobsen's flask; the denture is prepared for high-heat technic

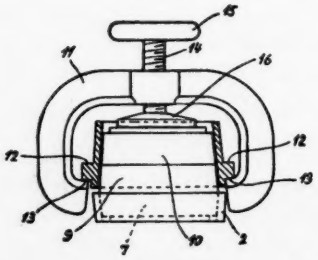

Figure 2 The flask during elimination of plaster

Use of denture powder

J.A.M.A. 162:152 Sept. 8, 1956

Q. Could there be chronic systemic poisoning from a denture powder containing sterculia gum, alkalized with sodium borate, particularly in relation to liver and kidney damage? Is there any evidence that such a preparation might be carcinogenic in relation to the liver and pancreas?

A. The occasional cancer related to artificial dentures usually is attributed to mechanical rather than chemical action. The presently employed plastics in dentures are not regarded as carcinogenic. Sterculia gum closely resembles tragacanth. The latter enters so many comestibles that its lack of damaging properties has been established through wide use. Notwithstanding, tragacanth is a recognized sensitizer and thus is responsible for some food allergies. It is presumed that this is true for the kindred substance sterculia gum. Sodium borate, likewise, has been introduced into so many products for human use that its relative harmlessness is well established. The proper use of a denture adhesive containing sodium borate may not lead to other than trifling and innocuous exposure.

▼ Crown and bridge

Pinledges as bridge anchorages. Pins and inlays combined (Los llamados pinledges como pieza de soporte de puentes fijos. Asociacion de espigas e incrustaciones)

Juan Mañes Retana. *An españ.odontoestomat.* 15:511-517 July 1956

An operator frequently wonders about the lasting qualities of a three-quarter crown or an inlay as a bridge anchorage, because the abutment may be only partially erupted, or small and conical in shape, or decay or traumatism may have destroyed the crown. In other instances the length of the bridge demands a solid attachment. Besides these mechanical reasons, there are esthetic ones, such as a desire to hide the gold on rotated or displaced teeth.

A pinledge preparation on an upper central incisor, for example, is begun with a proximal slice near the edentulous space, after which the lingual surface is cut to allow a sufficient thickness of gold in the restoration. Then the ledges are prepared for the pins, usually three—one in the region of the cingulum, the other two proximoincisal.

The ledges may be cut with a cylindrical stone, a tapering one, or a round stone which produces a funnel into which the pin slides with great ease.

The hole for the pin is cut with a small fissure or round bur, nearly 2 mm. in depth, with a diameter adequate to the pin selected. S. S. White makes a gold platinum wire with transverse grooves that anchors firmly in the cement. There are special burs manufactured by Maillefer whose length is that of the pin depth, which are terminated proximally by a shoulder that limits the penetration.

A special situation arises when it is necessary to use a Tinker crown as anchorage, but one proximal surface is so short that it is impossible to obtain a groove of sufficient length to permit adequate retention. In that instance a groove can be cut on the longer proximal surface, usually the one contiguous to the edentulous space, and two pins used to supplement retention—one pin near the cingulum, the other in the proximoincisal region away from the groove.

Impression taking, die, wax, and the other steps can follow the usual technic for this type of restorations.

Prosthetic treatment planning for the periodontal patient

Harold C. Sternlicht. *Texas D.J.* 74:401-405 Aug. 1956

There is little excuse for the haphazard planning of prosthetic treatment even if all conditions for success are favorable; if the patient has periodontal disease and poor occlusion, the planning must be meticulous if the remaining teeth and their supporting tissues are to be preserved.

The first step in planning the restoration of the partially edentulous mouth should be a diagnostic work-up as complete as is feasible. This will

include full-mouth roentgenograms, study casts, a clinical examination of the teeth, the periodontal tissues and the mucosa, a study of the general physical condition and a taking of the dental history, together with an assessment of the emotional attitude of the patient with respect to his mouth and its needs. The definitive plan should be delayed until all diseases involving dental and supporting structures are eliminated. Individual teeth should be evaluated for their abutment value, and the patient taught the correct and appropriate technics required for good maintenance of the teeth and gingiva.

The most important decision is the selection of either fixed bridgework, partial dentures, or a combination of the two. Generally, fixed restorations are more satisfactory as to comfort, esthetics and conservation of the supporting tissues to the abutment teeth.

Where removable dentures are required because of the lack of posterior abutments, it is common practice to construct a lingual or palatal bar with a saddle and two clasps with rests to engage the most posterior natural teeth serving as abutments. This design may be modified by means of stress-breakers. Many such dentures fail because of an insufficient number of abutments whose loss is hastened by the excessive forces brought to bear on them. This type of failure may be avoided through modifications designed to increase the rigidity of the abutment teeth, either by multiple retainers or by the splinting of two or more teeth. In the latter instance, the crown forms can be altered at the same time so that contour lines become more favorable for the positioning of direct and indirect retainers; much of the torque and horizontal thrust derived from the use of clasps placed over severely undercut crowns can be minimized. Deep rest seats or semiprecision rests incorporated in the castings serve to direct the forces close to the axial line and center of rotation where they are sustained with the least amount of trauma.

Rather than attempt the replacement of all the missing teeth on one appliance where more than two saddle areas are required, the use of fixed bridges in conjunction with partial dentures seems a more satisfactory solution.

The reported case illustrates the concepts discussed herein.

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Miscellaneous

Clinical problems in the use of alginate hydrocolloid

Kenneth R. Pfeiffer. *J.A.D.A.* 53:285-288 Sept. 1956

Since 1946 the author and others have used the alginate hydrocolloids as an impression material for removable partial dentures, crowns, inlays and bridges. Generally, these restorations and appliances have been fabricated with a high degree of success.

There is no special equipment required in the alginate technic except a metal syringe with a curved 18 gauge needle, instruments to retract gingival tissue, a clean plaster bowl, a broad spatula and an interval timer. The nonperforated rim-lock trays are preferred in handling alginate material for partial dentures and bridges.

The plaster bowl and spatula must be clean. When the syringe is used to eject the material into and around preparations or lug seats, ice water is preferred for the mix; an additional 6 cc. of water is used to produce a consistency which is ejected readily from the syringe. In the mouth all vital areas should be clean and dry.

The alginate impression materials afford sufficient accuracy and strength to provide excellent clinical results when properly used. They are also easy to manipulate.

The alginate materials, however, will deteriorate when stored for long periods above 37° C. Their use is contraindicated when all the margins of the preparations cannot be exposed visually and kept clean and dry during the impression procedure.

Operative dentistry

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Inlays and fillings

Diamond instruments designed for deciduous molar cavity preparation

D. J. Stewart and Richard R. Stephens. *Brit.D.J.* 101:107-110 Aug. 21, 1956

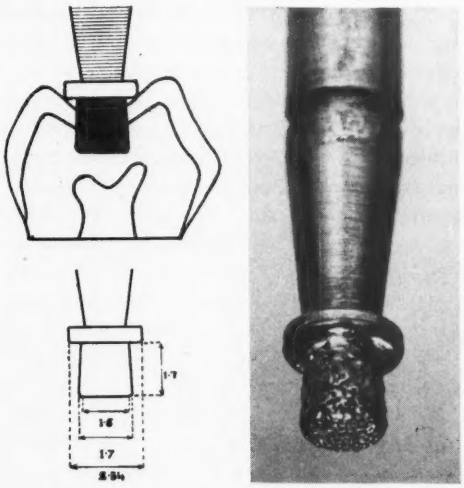
A major difficulty in restoring deciduous molars is the small amount of tooth substance available for cavity preparation. Cavity preparation in such teeth has been based on the general principle that these teeth cannot be penetrated beyond a depth of 1 mm. on all surfaces without danger of exposing the pulp. This danger of overpenetration led Levien to design (1954) a diamond instrument which incorporates a depth-regulating shoulder.

Because of the proximity of the pulp to the occlusal surfaces, locks for interstitial cavities in deciduous molars have to be much shallower than in similar preparations in bicuspids or permanent molars. The shallow lock is strengthened by being made wider. It is current practice in the department of children's dentistry of the Institute of Dental Surgery, Eastman Dental Hospital, to achieve this strengthening by making the isthmus not less than a half the intercuspal width of the tooth, the lateral margins being extended to lie at least halfway up the buccal and lingual cusps (Fig. 1).

Since the outline of the pulp chamber in a deciduous molar follows closely the external contours of the tooth, it is not possible to adhere to the principle of a flat occlusal floor for occlusal locks, without endangering the pulp. The occlusal floor of the lock of an interstitial cavity in a deciduous molar must follow the general contour of the external enamel surface in order that the maximum uniform bulk of amalgam throughout the entire restoration may be obtained without endangering the pulp. Since the cutting of a preparation conforming to this pattern is difficult

Figure 1 Above left: Width of the occlusal lock in an amalgam restoration in a permanent maxillary first bicuspid. Above right: Width of lock in maxillary first deciduous molar. Below: The outline, in section, of an occlusal lock at its widest point

Figure 2 Left: Diagram showing dimensions of the instrument designed for lock preparation of first deciduous molars, superimposed on a tracing of a section of such a tooth. Right: The depth-regulating shoulder and contour of the cutting surface of the instrument. Its shaft fits a miniature handpiece



to achieve with conventional burs, it is desirable to use an instrument with a cutting surface of a predetermined length and fitted with a shoulder to prevent overpenetration.

Figure 2 illustrates the dimensions of such an instrument and it also shows the depth-regulating shoulder and contour of the cutting surface. The softer enamel of deciduous teeth lends itself admirably to removal by diamond instruments at speeds obtainable with the usual type of dental engine. It is often possible (in the mandibular first molar at least) to fashion the lock in one single action; the lock can be widened readily by sweeping the instrument along the enamel edges to produce the desirable curved cavity outline with the minimum of vibration. As the diamond instrument is pressed buccally and lingually to widen the lock, it automatically rises up the cuspal inclines to avoid the pulpal horns. Figure 2 shows a section at the widest portion of the lock in a first maxillary deciduous molar after preparation by this instrument (now being manufactured in London).

Since the enamel of the deciduous molars has an average thickness on the occlusal surface of only 0.5 mm., any pronounced undercutting is undesirable.

In the preparation of a Class II cavity in a deciduous molar, the proximal portion should be first partially prepared and cut back to well supported occlusal enamel. The instrument is then inserted in this cavity so that the shoulder rests on the enamel edges and is pressed, rotating at high speed, into the occlusal enamel and dentin to fashion the lock. There is no danger whatsoever of excess penetration. When rotated at high speeds (not less than 8,000 rpm) and kept wet by employing some form of atomized water spray, this instrument will cut occlusal locks in deciduous molars in a matter of seconds. The depth regulation ensures that the pain experienced by the patient is negligible.

Comparison of the technics for direct acrylic fillings

Takao Fusayama, Masumi Ishibashi and Takao Kitazaki. *Bul.Tokyo M.D.Univ.* 2:235-242 Jan. 1956

The direct filling acrylic resin is chemically stable and cosmetically superior but has certain faults, the most important of which is that its curing shrinkage may produce gaps or apertures between the resin filling and the cavity walls.

The adaptation of direct acrylic fillings to cavities in extracted molars was examined microscopically to determine the best procedure for filling teeth with self-curing acrylic resin. The following conclusions were reached:

1. The apertures between fillings and cavity walls caused by the curing shrinkage of self-curing acrylic resin are liable to occur first in the corners around cavity floors, then spread to all cavity floors and walls. Apertures at the cavity margins are rare.

2. Fillings prepared by the proper pressure and nonpressure technics readily adapt to the hollows or sharp corners of cavity walls.

3. Cavity walls must be dry when direct filling resin is used. Alcohol or chloroform may be used for drying the cavity.

4. In the pressure technic it is inadvisable to coat the cavity walls with monomer liquid before packing.

5. In the pressure technic it is desirable to pack the powder-liquid mix at the doughy stage and press it at once.

6. The brush-on technic originated by Nealon is the best for direct acrylic filling. With this technic no apertures between the filling and the cavity walls result from the curing shrinkage of the acrylic resin.

7. The "once-pouring" technic used by some dentists in Europe is not desirable because it results in porous fillings.

Professional activities

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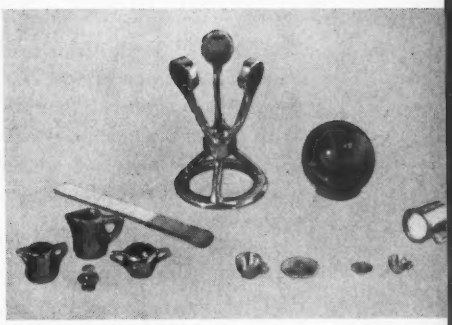
Hobbies



Left: Collection of miniatures. Right: From casting to finish. A match shows the scale

Making miniatures in gold

Mark Zimmerman, Toronto. *Alpha Omegan* 50:20-22 April 1956

It is but a short step from the making of inlays to the producing of gold castings of such objects as miniature teacups, goblets, candleholders, a coffee set, pendants, earrings and cuff links. When one meets successfully the challenge of producing tiny objects in gold, great and rewarding pleasures follow. In addition, satisfaction is derived from showing the completed objects.

All dentists are capable of producing both fine inlays and fine objects of art.

Sticks of extra hard purple wax can be used, which can be turned in the fingers of the left hand. Carving instruments include a sharp scalpel, amalgam carvers, small chisels and large spoon excavators (for the interiors of cups and goblets). The chisels and spoons are used to carve the stems and bases. Wax threads held high above a flame will be flexible enough to be shaped for handles, then luted to the object being produced. A 16 gauge wax thread is used as the sprue. Wax thread by the yard can be produced by loading an old-fashioned all-metal syringe with hard wax, heating the barrel gently, and forcing the wax out through the end to which the needle would be attached. Abutment gold which holds its lustre and polish best can be used for the casting.

Finishing is done with fissure and plug finishing burs, followed by carborundum stones, abrasive wheels, rubber points, finest cuttlefish disks, finest crocus disks, and rouge on a chamois wheel, in the order given. The bowls of miniature goblets are polished by using a large round plug-finishing bur, revolving backward.

Instructions for making individual objects, and photographs of many miniature gold objects, are included.

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Dentistry around the world

Dentistry in South Africa

(Die zahnärztlichen Verhältnisse in Südafrika)

E. S. Priester, Johannesburg, South Africa.
Deut.Zahnärztebl. 10:489-493 July 8, 1956

The Union of South Africa consists of four provinces: Cape of Good Hope, Natal, Transvaal and Orange Free State, and four protectorates: South West Africa, Basutoland, Swaziland and Bechuanaland. The Union is a member of the British Commonwealth but its sovereign independence is assured.

South Africa has a population of about 12,000,000 inhabitants, of which only one fifth belongs to the Caucasian race; the other four fifths consists of African natives, Asiatics and their descendants and half-breeds.

The general health and the dental condition of the population (especially in regard to the whites) compare favorably with the conditions of any European country. The complete division between white and colored people (apartheid), however, has influenced unfavorably the health condition of the nonwhite population and, therefore, the teaching and practice of medicine and dentistry.

Only two dental faculties exist in the Union. The first, at the University of Johannesburg, teaches in the English language; the second, at the University of Pretoria, in the Afrikaan language. The degrees bestowed on dental graduates are: (1) Bachelor of Dental Surgery (B.D.S.); (2) Master of Dental Surgery (M.D.S.) and (3) Doctor of Dental Surgery (D.D.S.). Additional degrees can be obtained by attending and completing postgraduate, specialized courses: (1) Higher Diploma in Dentistry (H.Dip.Dent.); (2) Diploma in Public Dentistry (D.P.D.) and (3) Diploma in Anesthetics (D.A.).

All these professional qualifications are registered with the South African Medical and Dental Council or the British Medical Council in London. The degrees and diplomas are recognized throughout the entire British Commonwealth.

Before the student is allowed to enter a dental university faculty, he is examined by the Joint Matriculation Board in (1) languages (English and Afrikaan obligatory, Latin, Greek, French or German optional); (2) sciences (mathematics obligatory, physics, biology, botany, chemistry or zoology optional) and (3) history and geography.

Admission is facilitated for (1) students who have passed the final examination of other medical or dental schools of university or college rank; (2) renowned artists, and (3) persons who have excelled in sports, politics and in other spheres of national importance.

The degree of Bachelor of Dental Surgery can be obtained after five and a half years of study, and after passing two examinations.

The requirements for the degree of Higher Diploma in Dentistry are as follows: (1) the possession of the degree of Bachelor of Dental Surgery; (2) a degree from a foreign university comparable to the South African degree; (3) proved attendance at courses in anatomy, physiology, psychology, pathology, dental and oral surgery, orthodontics, prosthetics, roentgenology, oral medicine and dental laboratory technics.

The degree of Master of Dental Surgery can be obtained only after both the degree of Bachelor of Dental Surgery and the Higher Diploma in Dentistry have been acquired. A dissertation is necessary which must contain the following: (1) a selected scientific topic with dental aspects; (2) a critical review of the literature on the topic selected; (3) a report on at least 20 cases treated by the candidate and (4) a confirmation that the candidate has concluded successfully special studies in other dental branches.

The degree of Doctor of Dental Surgery is obtained in a manner similar to that in the United States and England. The candidate must prove that he has undertaken essential research.

At present, treatment in private dental offices is expensive. A practicing dentist, to be successful, must live at a high standard because, according to the psychology of South Africans, "A dentist without a car cannot be a good dentist."

▼ Hospital dental service

Dental service in the hospital program

H. R. MacLean. *J.Canad. D.A.* 22:404-406 July 1956

Ideally, the dental staff in a hospital should be built on a basis of complete service to the patient, and should be divided into the following sections: pedodontics and orthodontics; periodontics and endodontics; diagnosis; oral roentgenology; oral pathology and oral surgery.

Oral diagnosis is the first step in planning an orderly sequence of oral treatment for the patient. It is the result of a clinical examination, laboratory tests where necessary, and an oral roentgenographic survey. The data should be compiled in a written report and attached to the patient's record.

Dentistry for children is probably the most important section. It is here that early observation by a specialist can detect deviations from normal in growth, development and function. Corrective and preventive procedures can be planned and used. The care of handicapped children requires a trained and experienced pedodontist.

Such programs would furnish excellent teaching material for graduate and undergraduate students, who could build up a series of recorded histories as material for scientific articles. This would stimulate research projects. Research in dentistry in a hospital program is not the task for dentists alone, but requires the cooperation of general clinicians, pathologists, bacteriologists and physiologic chemists.

Staff conferences and rounds are an instructive part of a hospital program, and the dental department should participate.

Two misconceptions are prevalent on the subject of hospital dental service—that medicine does not want dental services in hospital programs, and that the majority of dentists are anxious to obtain appointments on hospital staffs.

The responsibility for developing a dental service plan is dentistry's. If and when the standards of organization are equal to medicine's and the services can be integrated in an approved manner, dentistry's services will be accepted.

Few dentists wish to do hospital work. The greatest difficulty will be to find the trained personnel willing to devote a portion of time to this type of service.

A hospital cannot be expected to invite a group of dentists to become staff members—to participate in hospital procedures, and at the same time offer to indoctrinate these men into that field. This should be the responsibility of the dental department. The dental department should seek two objectives: (1) to be familiar with and to maintain the existing standards in the hospital, and (2) to integrate dental services into hospital procedures without disrupting existing services.

▼ Auxiliary groups

Training facilities in Yugoslavia

W. A. Warrington. *D.Technician* 9:57-58 June 1956

In Yugoslavia dental surgeons, dentists and dental technicians are members of one trade union. Dentists perform only surgery connected with prosthetics. There is no difference in status between the three members of the dental team. Dental surgeons earn 10 per cent more than dental technicians when they are employed by the state. Both surgeons and technicians are allowed to work privately; that is, dental surgeons may have a private practice, and dental technicians are allowed to construct, in their own time, in their own laboratories, work that they can attract from dental surgeons.

Prior to 1945, when the state took over training, there was no development of technicians through apprenticeship. Technicians were badly paid and poorly treated.

Three new training schools for dental technicians have been established, adjacent to dental hospitals. Students are accepted from schools teaching the usual subjects. A small fee is charged if the parents are able to afford it; otherwise, students are fully supported by the state during training.

The training period for dental technicians is four years. Girls and boys are admitted. Failure to make the grade during any part of the four year course leads to dismissal from school. But should the student possess the necessary qualities, he may proceed with studies and train as a dentist or a dental surgeon.

The first year at the training school is devoted mainly to the study of tooth anatomy. In the second year partial denture work, bridges and crowns are studied. Silver is used as a teaching metal. When the student passes his examinations in metal work, he begins to work on complete dentures. In the first two school years only practice work is given, but during the final two years, work is given to the students from the state dental clinics.

Admission is limited to 180 students. By 1962 there will be two dental surgeons to one technician.

▼ Literature

The importance of negative reports to the scientific literature

Austin H. Kutscher. *J.D.Educ.* 20:191-194 May 1956

Although advances in medicine and dentistry have been based on both negative and positive findings, the role of a negative report has been under-emphasized.

Cogent reasons for both reporting and reading negative findings include the following:

1. Negative reports form a basis for rejection of advertising claims by the Pure Food and Drug Administration and the Council on Dental Therapeutics of the American Dental Association. If negative findings are not available, the evaluations made by such bodies will be unbalanced in favor of the positive reports.

2. Negative findings belong in the literature rather than as simple statements to the Councils, since only in manuscripts do investigators detail the methods, results, discussions and conclusions necessary for over-all evaluation of the usefulness and toxicity of a drug by other researchers.

3. If negative reports were available and were emphasized reasonably in the classrooms, fewer ineffective and potentially dangerous drugs would be prescribed.

4. Untold amounts of wasteful duplication of effort might be avoided were failures reported.

5. Negative findings have been known to incite the imagination of another investigator in the right direction.

6. A negative report requires confirmation by a subsequently published additional negative report if the original hypothesis or findings were of value.

7. Negative reports are needed to counterbalance overenthusiastic positive reports and advertisements.

The American Dental Association, the American Medical Association or the Armed Forces Medical Library might undertake to publish a journal devoted solely to negative reports. The publication of a negative report clears untruths from the scene. Investigators should not be dissuaded from submitting negative reports for publication by unthinking review boards, critical colleagues or selfish outside interests.

▼ Licensure

Memorandum of the F.O.C. to the Secretary of Public Health (Memorandum de la F.O.C. al señor Ministro de Salud Pública)

H. Neira Flórez, R. Torres Pinzón, A. Delgado Morales and others. *Rev.Fed.odont. Colombiana* 7:219-224 Jan.-Feb. 1956

Up to 1905 the practice of dentistry in Colombia was in charge of dentists from the Colegio Dental de Bogotá, which was established in 1888 and at the time was the only dental school in the country. Practical dentists, in great number, practiced dentistry under the claim that they had acquired experience from practice and that the number of graduate dentists in the country was small with

respect to the large population that was in need of dental care.

Laws against free dental practice were introduced for the first time in 1905, but they were soon repealed under pressure from the practical dentists. Thereafter, several appeals were made by the dental profession to the government to deny practical dentists the right to practice. Laws for this purpose were enacted in 1914, 1923, 1931 and 1937, but they were modified and even repealed after petitions to the authorities on the part of the practical dentists who wanted to regain free practice.

Law 51 of 1937 gave practical dentists the right to practice dentistry provided they had been practicing for more than ten years and could give proof of their competence by taking an examination before the proper authorities. The clause which required an examination on the part of practical dentists was repealed by Law 128 of 1937. The clause of the same law that concerned the ten years of dental practice on the part of the practical dentists was repealed by the 1946 Congress, re-established through a veto of the President and by the laws of the 1947 Congress, again repealed by the Council of the State in 1952, re-established in 1953, and once more repealed by Law 124 in 1954. This law gives practical dentists the right to practice if they have been practicing for at least ten years.

The 1954 law places practical dentists on the same level as professional dentists. It kills the ambition of the dental students who began their university studies on the same day on which this law was passed. It discourages the university students who are getting their professional training the hard way, because the practical dentists are given the same financial opportunities in an easier way. The dentists who graduated from the universities in the 1938 course had on their graduation day faith in the moral value of the dental profession. Now those concepts no longer hold true because those dentists share the practice of dentistry with unprepared practical dentists.

The Federación Odontológica Colombiana, therefore, requests from the Secretary of Public Health that (1) Law 124 of 1954 be repealed and (2) the previous law which was based on university standards for the practice of dentistry be made permanent. Law 124 of 1954 endangers the health of the public and minimizes the respect of civilized countries for Colombia where the care of the dental health of the population is shared by both the competent and the unprepared dentists.

▼ Civil defense

The role of the dental officer (in the management of mass casualties)

J. V. Niiranen. *Mil.Med.* 118:404-407 April 1956

Humanity must include attack by atomic or thermonuclear weapons among those disasters for which it prepares. Survival from such an attack would depend in part on the nature and extent of the preparation to meet it. Atomic warfare leads to utter destruction of the physical make-up of a city. There would be no remaining transportation system, food supplies, communications, water, sewage disposal or electricity; 80 per cent of the hospitals of each of the target cities of the United States would be knocked out with but one well-directed bomb in each city.

The success of the medical effort in recovery from an atomic disaster will depend on full cooperation between the health services and other services in the Civil Defense organization. Dentistry, as a health profession with a valuable advanced casualty care potential, has a responsibility to contribute a large part of trained personnel to this effort. The 90,000 dentists of this country, with their sound basic medical science training, their experience in handling patients under various conditions, their close association with their medical colleagues in the mutual care of patients, are ideally qualified as a group of able assistants to the medical men in providing emergency casualty care.

The dentist can provide assistance in any one of three ways. He may provide direct emergency care through administration of anesthetics, parenteral therapy, or the treatment of wounds, burns, shock or radiation problems. Secondly, he may provide administrative assistance, perhaps by assisting in sorting and classifying casualties,

or by organizing groups, or by arranging for provision of needed facilities and supplies. Thirdly, he may train others in casualty treatment. Of course he should be able to provide emergency casualty treatment, whether it be only for members of his own family, and perhaps his neighbors, or for many others beyond his personal associations.

Dentists require practical training in casualty treatment to develop the skills that would be demanded in a disaster situation. The most important consideration is the planning and formulation of a training program. First aid training should be succeeded by advanced instruction in emergency casualty care. This may be arranged through cooperation of the local medical societies, medical schools, dental schools, and the American National Red Cross.

The Naval Dental Corps, through the U.S. Naval Dental School, has developed a training course in casualty treatment. The 35 hour course of instruction includes lectures, demonstrations, films, practical application of first aid procedures on trainees, and practical application of procedures on available training aids.

▼ Education

Dental education in Switzerland
(Orientation de l'odonto-stomatologie)

René Jaccard. *Rev.mens.suisse odont.* 66:437-447 May 1956

In Switzerland, dentistry is regarded as a specialized branch of medicine. Twenty years ago, a complete reform of medical education was planned, based on from seven to eight semester courses of basic medical training necessary to obtain licenses to practice. This education was to be completed by specialized training in one of the various branches of medical science including dentistry. This project, however, never materialized.

The licensure of dentists, including oral surgeons, is firmly established in Switzerland, and is regulated by federal and cantonal laws. Swiss physicians interested in specialized practice can obtain the exclusive right to such a practice from the Swiss Medical Association, based on specialized training in hospitals for a period of from three to five years. Swiss dentists, however, have not received the same opportunity for specialized practice.

With the successful example in dental education in the United States and in Scandinavian countries, it appears desirable to create also in Switzerland's universities and colleges faculties for dentistry. These faculties should be independent of medical faculties to assure dentistry the autonomous and respected position it deserves among the other branches of the public health service.

The "stomatologist" who in Switzerland is a physician specializing in dentistry on the basis of at least 12 semesters of medical university training and 6 semesters of dental training, is not an adequate answer to the present need for more and better educated dentists.

Medical training should include a course in dentistry because medicine—in its broadest definition—includes dental science.

Through the Fédération Dentaire Internationale, an attempt should be made to unify dental curriculums of universities in the European, American and Asian countries by collaboration of national authorities, national dental associations, the World Health Organization and UNESCO.

The training of a dentist

H. G. Radden. *Austral.D.J.* 1:2-7 Feb. 1956

A dental graduate should have acquired the following abilities: (1) familiarity with the most recent investigations into the causes of dental disease in order to advise his patients of preventive measures; (2) capacity to restore and remove teeth and fit dentures; (3) ability to recognize and treat the more common afflictions of the investing structures of the teeth; (4) ability to recognize potential and early malocclusion, and to treat the simpler forms, and (5) ability to recognize any deviation from normal in the oral mucosa and to know and put into effect those

steps required to remedy a local condition and to appreciate when systemic disease may be a factor in the pathology.

For further progress in dentistry, a number of steps must be taken. More dental research workers should be trained. First year dental students should attain the level in preclinical studies required in a science department. It is desirable to teach anatomy and physiology in close liaison; teachers of these subjects should have freer access to patients.

During the clinical years emphasis should be placed on teaching at the chairside, and formal lectures should be reduced to a minimum. In conservative dentistry, the ratio of one demonstrator to every six or seven students should not be exceeded. Part-time teachers have much to offer, provided they are chosen carefully and do not form the majority of the staff. They are best able to relate the teaching to conditions existing in the profession.

It is doubtful whether specialization should be encouraged in an undergraduate school. Knowledge of the specialties is so extensive that no attempt should be made to cover in the undergraduate school the whole of any one specialty.

Most graduates will, during their early years, practice general dentistry; some attempt should be made to integrate the teaching into one composite whole during the latter months of the undergraduate course. Such a course, comprising oral diagnosis and treatment planning, should be conducted by the most mature teachers. The student should be given suitable patients, preferably those coming for the first time.

If the dental schools in Australia are to rank with the best, young men should be assisted in gaining overseas experience. To facilitate an interchange of ideas, some interchange of staff might be arranged at various levels, and a system of external examiners be initiated, as in Great Britain.

Dental teaching posts should be made so favorable as to be sought by many. This means ensuring adequate facilities for research in the way of free time and equipment and paying a salary commensurate with the responsibility and competitive with that received elsewhere in the profession.

▼ Interprofessional relations

Otorhinolaryngology and dentistry: common problems (Oto-Rhino-Laryngologische Grenzfragen für Zahnärzte)

E. H. Majer. *Österr.Zschr.Stomat.* 52:603-605 Nov. 1955

A definite relationship exists between dentistry and otorhinolaryngology; therefore, cooperation between these branches of the healing arts is important and necessary.

In many instances, otologists use the same surgical instruments as dentists, especially on patients in whom hearing defects are to be corrected by surgical intervention (otoscleronectomy and tympanoplasty in chronic otitis).

The modern laryngologist is as much interested in the vitality of the teeth, their pulps and root apexes as the dentist, and many of his surgical procedures resemble those of the oral surgeon.

The main indication for surgery in the region of the maxillary sinus is the occurrence of rhinogenous empyemas. Before surgery is attempted, however, a thorough examination by the dentist is necessary to establish whether causative factors are present in the oral cavity.

The main causes for disturbance of nose breathing, important also for the dentist, are adenoids in the nose and the pharynx region. Before adenoidectomy is undertaken, a consultation with the dentist is recommended.

Before the causes of earache are determined by the otologist, the dentist should establish whether causative factors (pulpitis) are present in the oral cavity. Frequently, pain radiating to the ears is a result of dental disease.

The problem of the different types of focal infection should be as interesting to the dentist as it is to the otorhinolaryngologist.

In diagnosis, prognosis and therapy of many diseases occurring in the nasal, aural and oral regions, such as infectious mononucleosis, stomatitis aphthosa, herpes zoster of the mucosa, herpes zoster oticus and many other disorders, both dentistry and otorhinolaryngology are involved.

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Miscellaneous

Green light is best

Willard Frier. *J.California D.A.&Nevada D.Soc.* 32:193 May-June 1956

Dentists may reduce the reflection of light rays by utilizing green towels and drapes for patients. The use of dark, rough towels and drapes is recommended. Some of the towel supply firms will provide green towels and drapes. Many hospitals now use green towels and drapes in surgery.

In some dental offices one overhead light over the patient and another over the cabinet will help to relieve eye fatigue.

The dentist and his health

Edward Line. *D.Mag.&Oral Topics* 73:85-88 June 1956

Careful organization of dental practice is necessary to arrive at conditions conducive to good work. Dentists need outdoor pursuits and interesting hobbies to offset the cramped, intense, confining conditions existing in some practices, particularly in the larger cities.

The dentist should seize every opportunity for outdoor exercise, and should arrange some walking daily. The dentist can best avoid mental and physical strain by planning his work and leisure.

Working hours should be controlled to allow time for exercise and relaxation.

Faulty posture at the chairside is too common. The dentist should have suitable footwear, and shoes should be changed at midday. Dentists should avoid overweight, and should give proper time to meals. Work should be varied, and a stool employed at least part of the time. Between appointments the dentist should stretch his limbs and do a few simple exercises.

The dentist when working should shift his weight to both feet, and stand with feet not too wide apart. He should avoid putting all the weight on one leg. He should stand close to his work and avoid all twisting. An arm rest fitted to the chair may prevent the fatigue sometimes felt in the left shoulder when holding the mirror for long periods.

The working position should be varied constantly. Output can be increased by employing efficient assistants and by having the surgery equipment arranged so that time is not lost in walking about looking for materials.

The dentist is exposed to all kinds of infections; he can keep his resistance high by having fresh air and regular exercise. The office should be well ventilated. The diet may be supplemented with vitamins and fruit juices.

The dentist should have his eyes tested periodically, and should beware of eyestrain. It is helpful to look at distant objects when possible.

With advancing age the dentist should observe moderation in all things. Adequate and frequent holidays are essential to anyone in general practice today. A right attitude to life and people is most desirable for the dentist. Dentistry is a branch of the healing profession; if the immediate material reward of the dentist's labors is not always apparent, there can never be any regret about work well done, or a service gladly performed, however humble the patient.

$19,500 in loans for flood victims

J.California D.A.& Nevada D.Soc. 32:172 May-June 1956

Nine California State Dental Association members who were recent flood victims refused gifts of money with which to repair their flood-damaged homes and offices. Instead, the nine agreed to accept loans, ranging from $500 to $4,000, and totaling $19,500. The loans are interest-free and repayable at the convenience of the recipients.

The funds were made available by 454 association members subscribing $11,042; the board of directors voted $5,000 from the association's general fund, and the standing relief committee transferred $3,458 from its restricted account. The general fund and the relief committee will be reimbursed when the notes are repaid. The balance of the money will be set aside for interest-free deferred payment loans for future state association disaster victims.

Basic science

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Histology

Epithelial attachment at the neck of retained teeth and on teeth in follicular cysts (Über das Verhalten des Epithels am Hals retinierter und in Follikularzysten sitzender Zähne)

G. Csepura, Debrecen, Hungary. *Deut. zahnärztl. Ztschr.* 10:1225-1230 Sept. 15, 1955

The "zone of disintegrating epithelial attachment cuticle" (Bass) on erupted and on retained teeth, especially those in follicular cysts, was examined recently at the Stomatological Clinic of the University Debrecen, Hungary. The existence of such a zone was demonstrated clearly on erupted teeth only by an intensive, unequal staining around the circumference. Localized short interruptions could be observed. In instances where extracted retained teeth and teeth found in follicular cysts were studied, no similar observation could be made. The epithelial attachment at the neck of retained teeth was investigated histologically on 11 specimens. The previously reported growth of the epithelium in a downward direction over the junction of cementum and enamel (Gottlieb) was not observed in these specimens or in four additional teeth removed from follicular cysts.

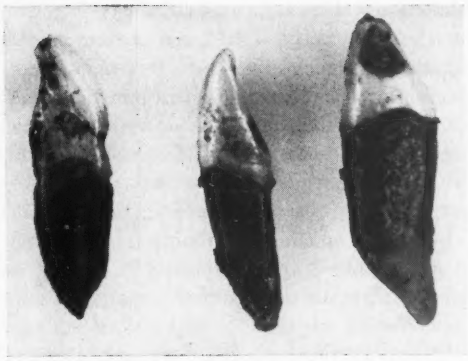


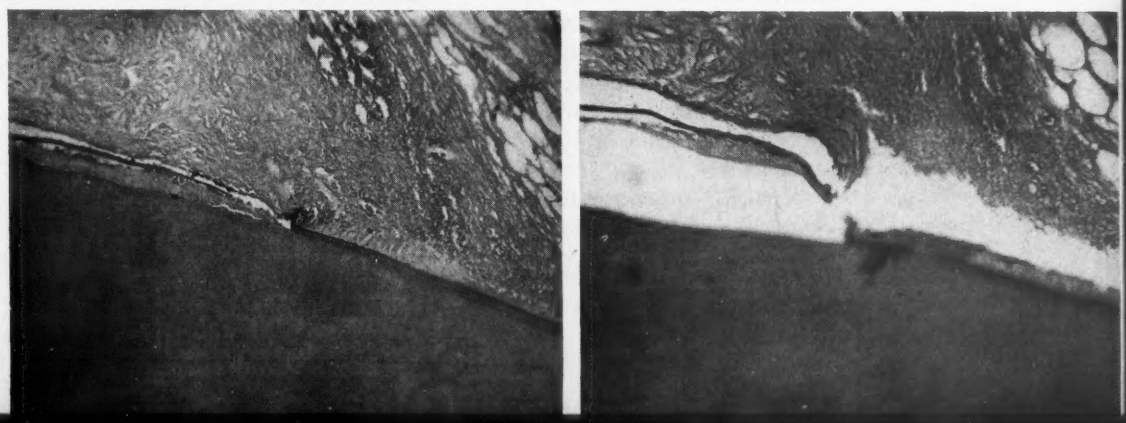
Figure 2 "Zone of disintegrating epithelial attachment cuticle" in erupted incisors

This development of the epithelium in a downward direction, Gottlieb assumed, is the result of the aging process in the cementum. The author's findings, however, contradicted Gottlieb's theory, because such a growth was not observed in young or in old patients.

According to Adler, continuous tooth eruption is caused by both the heterotopic development and the heterochronic differentiation of epithelial cells of the dental follicle.

Kreiker and Kettesy, in their contribution on homeotopy and heterotopy, state that only homeotopic epithelial cells can unite. According to this theory, therefore, no real fusion can occur between the epithelial surface of the oral mucosa and the epithelium of dental follicle. The surface epithelium of the oral mucosa, developing at a later stage than the epithelium of the enamel of erupted teeth, is inclined to eliminate the tooth. The opinion of Adler, Kreiker and Kettesy is in

Figure 1 Left: Neck of tooth retained in a follicular cyst. Right: The epithelium is detached from the neck of the tooth. No development in a downward direction



full accord with the author's findings, in regard to the nonexistence of the "zone of disintegrating epithelial attachment cuticle" in retained teeth and of the questionable growth in a downward direction of the epithelium on either retained teeth or on those found in follicular cysts. No such downward development can occur as long as there is no contact between the dental follicle epithelium and other epithelial tissue. These findings were established independently and did not change when patients of different age groups were examined or when mechanical factors, influencing the development, were present. Deriving from the same matrix, in synchronous differentiation, the continuity of the dental follicle epithelial cells is preserved at the neck of retained teeth even when these teeth are retained in follicular cysts.

These findings, contradicting previous reports, lead to the assumption that in erupted teeth the contact of heterotopic epithelial cells with heterochronic cells may be the cause of the growth of the epithelium in a downward direction.

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Anthropology

The teeth of animals

(Les dents des animaux)

Geo Beltrami. *Cah.odontostomat., Marseille* 5:17-39 Dec. 1955

Nature did not produce the human dentition as a unique creation. In its present-day state, human dentition is the result of a long evolution.

Neither the human nor the animal tooth is a bone. The teeth developed by a secondary calcification of cutaneous structures. In the course of an extended evolution, dermic papillae adapted themselves to the efforts of prehistoric animal species to masticate the available food.

In all vertebrata, the tooth development is histologically perfect. Pulp, dentin, enamel and cementum are present. Evolution has occurred only in tooth arrangement and fixation.

In most species of animals, an invariable tooth arrangement appears which can be best expressed in the dental formula: 12 incisors, 4 canines, 16 premolars and 12 molars; altogether 44 teeth.

Animal teeth appear in three distinct groups: the incisive and prehensile anterior set (incisors and cuspids); the posterior set used in comminution (premolars and molars), and an intermediate set, strongly developed as weapons (tusks) especially in many species of *Phytophaga.*

In *Phytophaga,* the anterior tooth set is always reduced in number. The molars, abraded by mastication, are numerous, and several dentitions occur. Many species have no canines.

In *Creophaga,* the anterior set is permanent and completely developed. The posterior set, however, is reduced in number, and only a few molars in which the tubercles are provided with cutting edges (secodonts) remain. The largest of these teeth, the carnassial tooth, is either the last premolar in the upper jaw, or the first molar in the lower jaw.

In the human phylum, beginning with the *Arboricolous insectivora,* all teeth are secodonts. *Lemuridae* have lost four incisors and four premolars. The apes of the New World (*Cebidae*) have one more pair of molars in each jaw than the apes of the Old World (*Cercopithecidae*).

Recent man's dentition is in transition and is evolving farther from that of the more efficient (hypothetical) ancestral types presented by fossil remains. The emphasis on the differentiation between the dentition of man and ape, based solely on the fact that most human molars have four cusps and molars of apes five or more, is misleading. Toward the end of the nineteeth century, the French anthropogist Larted discovered that the mandible of an early species of man, excavated at Sansan, France, also had five flat tubercles (three on the buccal and two on the lingual side), separated by grooves shaped like the letter Y. Such pattern in cusp formation, the *Dryopithecus* pattern, is identical with that found in the mandibles of anthropomorphic species of apes.

Some human species, however, still present a similar *Dryopithecus* pattern in the molars of both jaws. Usually in modern man, five cusps appear in the first lower molar only. The other molars have lost one tubercle and are reduced to four cusps separated by cross-shaped grooves. This formation can be termed the human pattern.

▼ Pharmacology

Our antibiotic age

Helen Vasil. *Wisdom* 1:6-9 May 1956

The coming of the antibiotic age has saved millions of persons the world over who might be dead had it not been for the life-preserving "miracle" drugs. Antibiotic researchers have only begun to learn the secrets of this new field of science which started with a pinch of earth in a test tube —a development from the time primitive man used dirt, water and leaves as remedial applications.

Since Alexander Fleming in 1928 discovered penicillin, over 4,000 antibiotic substances have been isolated and identified. Of these only 17 have passed the strict tests required before acceptance for general use.

The search and research for new antibiotics, described as "looking for an undescribed needle in an unlocated haystack," challenges modern scientists who have seen the effect of the "standard" drugs.

Surgery that a decade ago would have been undertaken only in extreme cases or not at all, today is almost casually performed because antibiotics prevent postoperative infections.

The oldest antibiotic, penicillin, was discovered accidentally when a bit of mold fell on a culture plate of virulent germs. Although Dr. Fleming believed at first his culture colony had been "contaminated" by the mold (penicillium), he observed the effect. The germs around the mold were destroyed and the antibiotic was recognized. Dr. Fleming's experiment was repeated and the antibiotic was extracted from the mold, isolated and purified.

Since 1941 when the first dose of penicillin was given to a London policeman who was dying of blood poisoning, the success of this antibiotic has been phenomenal. When the German "blitz" made it impossible for England to concentrate on laboratory achievements, America took on the job of developing a process to grow the precious antibacterial molecules that later saved many lives in the Allied Armed Forces.

The first step in the search for a new antibiotic is to place a pinch of soil in a flask of nutrient. Any such pinch contains spores of molds—perhaps 20 or even more. When those molds begin to grow, an experienced scientist can determine whether any of the growth is promising. If it is, the growth is transplanted to a separate tube and nourished. Then it is tested against hard-to-kill bacteria, fungi, protozoa and viruses.

If the mold is able to kill any form of germs, it is grown in larger quantities and again tested against germs developed in live animals. The parent mold is identified, the configuration of the antibiotic molecule is established and the chemical problem, extracting, isolating and purifying is solved. Often, if the new antibiotic proves to be unsuited for use in human patients, the procedure may be lost labor.

▼ Psychology

Psychologic effects of drugs

(Über seelische Wirkungen der Arznei)

Günter Clauser. *Deut.med.Wschr.* 81:370-376 March 16, 1956

Psychologic factors are important in relation to the effects of drugs and the persistence of disease. The influence of the physician's or dentist's personality on the prescribed drug's effectiveness by conscious or unconscious suggestion cannot be overemphasized. Such an influence can make placebos effective even in the treatment of organic diseases.

Psychotherapy may remove psychologic symptoms and also affect, at least temporarily, the course of a disease and the effect of a drug.

Drug therapy may influence the total constellation of the patient's psyche as much as his conscious, subconscious or unconscious attitude can modify or even determine the action of a drug.

Conditioned reflexes probably are involved in the positive action that occurs after the administration of placebos.

In testing the effectiveness of drugs on human beings, all these factors must be considered. "Double blind" evaluation usually is necessary to insure the correctness of such tests against the suggestibility of patient, physician or dentist. Positive and negative suggestion, however, should be used to reinforce other precautions against present conscious or unconscious bias.

In several tests, positive responses to placebos obscured the real effects and the effectiveness of drugs being investigated.

Also, external factors, such as the manner of administration or application, the drug's color, shape, appearance and even its name or packaging, may influence its effectiveness.

It is essential to analyze and to distinguish whether organic or psychologic factors influence the effect of the drug.

The psychotherapist can base his judgment on physical examination as well, and should not rule out the possibility of organic disease in the presence of psychologic symptoms.

Loss of teeth as a symbol of death: periodontosis as psychic trauma
(Zahnausfall als Symbol des Todes: Paradentose als seelisches Trauma)

E. Heinrich. *Deut.Zahnärztebl.* 10:477-478 June 22, 1956

For many sensitive persons, loss of the teeth from natural causes seems to be a manifestation of age, senility and death. For dentists it is often difficult to realize that alterations occurring in the inner life of his senescent patients may have passed the state of harmlessness. Only in patients known to the dentist for many years can mental changes caused by loss of teeth or dental diseases be diagnosed as primary symptoms of hypochondria. These symptoms often intensify steadily and may lead to a more or less pronounced melancholia.

When clinical experience fails to explain complicated psychic phenomena, novelists often are able to furnish information in the form of fiction.

The Austrian novelist, Alfred von Berger, described in his short story *Eysenhardt, District Attorney* a prominent lawyer who had expected to be appointed to the country's highest law position, minister of justice. After the appointment seemed to be secured, Eysenhardt celebrated the occasion by giving a banquet for his friends and supporters. Suddenly, he felt that one of his incisors was missing. He found the tooth below the table, and an immediate examination of his dental arches with the tongue revealed that the other anterior teeth were loose also.

The effect of this discovery was in disproportion to the significance of the event. Eysenhardt was unable to participate further in the festivity, excused himself and left for home.

There, in complete solitude, he looked at the tooth with feelings of animosity. Something terrible, incredible and incomprehensible had happened to him. This small elongated, yellowish, bonelike piece had been a part of his organism, a valuable constituent of his personality. It had functioned satisfactorily in mastication and speech. A look into the mirror revealed how the gap in the dental row distorted his face. This tooth, a now strange and lifeless thing, was a symbol of approaching death.

Eysenhardt remembered how his parents had aged, how their teeth were lost one by one, how their hair became white and sparse, how senility and disease had stricken them until death had appeared. Previously, Eysenhardt's self-centered thinking had never permitted him to compare such events with those of his individual life. His parents were weak and old, but he still was young and strong, still growing in body and intellect.

Suddenly, everything seemed different. Like this little tooth in his hand, he too had lost vitality. An inevitable future faced him. He would lose vision, hearing, memory, speech, his individual talents and abilities, his intelligence and professional knowledge, his health and his life.

This symbol of death, the tooth, must be destroyed. And destroyed it was. This act of destruction was the primary step toward doing away with himself.

Although his dentist was able to restore Eysenhardt's facial appearance, the disturbance in his inner life was not eliminated. He was unable to strive further to obtain his aims.

Eysenhardt had developed an obsessional neurosis which led to paranoia. He sank deeper and deeper morally, and in moments of mental derangement, he attempted suicide unsuccess-

fully. He later mingled with unsavory characters, and became a criminal among criminals.

All concepts of this novel can be verified easily by psychoanalytic and psychotherapeutic experience. Many types of neuroses or psychoses originate from seemingly insignificant events, and mental disorders, often marked by delusions, may lead to self-destruction.

In periodontosis, the degenerative disturbances and the recession of the gingiva frequently cause loss of teeth. As in the novel, the patient may develop symptoms of functional nervous diseases such as true hysteria, neurasthenia, manic-depressive psychosis or schizophrenia.

Berger's novel contains an extraordinarily fine description of the relation between tooth loss (probably caused by periodontosis) and mental deterioration.

Certainly, loss of the teeth as a severe psychic trauma and as a symbol of death is an exceptional case. The development—in series—from hypochondria to psychoneurosis to self-destruction in the form of suicide or crime usually is caused by other experiences and events than loss of a tooth.

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Pathology

Differential diagnosis of vague headaches and facial pains: disturbances in the function of both jaws

(Zur Differentialdiagnose unklarer Kopf— und Gesichtsschmerzen: die Bedeutung der Funktionsstörungen der Kiefer)

Th. Kirsch. *Deut.med.Wschr.* 81:298-301 March 2, 1956

Although the clinical symptoms of true trigeminal neuralgia are characterized by tic douloureux, involvement of the gasserian ganglion and of the root and branches of the trigeminal nerve, various other vague pains occurring in the regions of the head and the face frequently are attributed to this type of neuralgia.

The true cause of many such phenomena often is not discovered by physicians. Only dentists, during periodic examination, discover that frequently such vague headaches and facial pains accompany abnormalities of the dental system or malocclusions.

In many instances, a simple method of treatment is the insertion of correctly constructed dental prostheses. Loss and malposition of teeth may cause abnormal strains on the temporomandibular joints which in turn can cause a change in the normal balance of the masticatory system and produce pain in neighboring nerves and vessels. Such radiating pain may reach the regions of the temples, eyes, zygomatic bones and the back of the head.

In the course of such vague headaches and facial pain, buzzing and severe pain in both ears, difficulties in masticatory function and disturbances of taste and smell may occur. The patients rarely complain of pain in the temporomandibular joint.

In three cases reported, the previous diagnosis had been trigeminal neuralgia. Malocclusion resulting from missing teeth and faulty artificial dentures, however, was recognized to be the major cause of pain. After correctly fitting prostheses were inserted, the pain disappeared and did not recur.

Various types of injuries to jaws and teeth, especially loss of several teeth, should be treated immediately with perfectly fitting dentures to prevent not only future malocclusions but harmful consequences such as severe pain in the face and head regions.

Monocytic diseases as sequela of dental focal infection

(A monocytászám változása mint a gócbetegség diagnosztikai jele)

György Kovács and Kornél Lelkes. *Fogorv.szemle* 49:177-181 June 1956

Mononucleosis (mononuclear leukocytosis) is characterized by a transient increase in the number of mononuclear leukocytes in the circulating blood. This monocytic disease can be divided into physiologic and pathologic types.

The physiologic type includes the forms incidental to digestive disturbances, disorders accom-

panying pregnancy and increases in the proportion of monocytes in the blood often caused by muscular overexercise.

The pathologic type can be classified as inflammatory, posthemorrhagic and toxic subvarieties.

A relation between inflammatory or toxic mononucleosis and dental focal infection exists, although the presence of dental foci does not always cause monocytic alterations. Within certain limits, however, it can be assumed that the more severe the focal infection, the greater the monocytic change.

As a general rule, infectious mononucleosis shows primarily a more pronounced increase in polymorphonuclear neurophils than in lymphocytes.

Monocytic diseases are part of the response of the organism to focal infection.

Dental focal infection was established in 60 per cent of patients examined who were afflicted with three clinical types of mononucleosis (glandular, monocytic and febrile).

Molluscum pseudocarcinomatosum

Sheldon Oscar Burman, Joseph A. Buckwalter and John R. Carter. *Surg.,Gyn. & Obst.* 102:574-580 May 1956

A substantial portion of lesions which have been termed squamous carcinoma are in fact something quite different. Molluscum pseudocarcinomatosum is a benign lesion which does not warrant radical surgery or a guarded prognosis. Its inclusion in a series of "successfully treated" epidermoid carcinomas of the skin gives an erroneously sanguine impression regarding the true malignancy of that particular cancer.

The excrescence, which usually is single but may be multiple, and which generally is found on the face, begins as a tiny, painless papule which grows rapidly to achieve maximum size in six to eight weeks. The size of the mature lesion varies and may involve half the lip. If the tumor is left untreated, regression usually begins in six to eight weeks and often is complete in four to six months, leaving a small, dimpled scar or puckered depression. When mature, the nodule is rounded or slightly flattened, hard, fixed, white with slight erythema at the base, and with a rolled edge. Nearly always at the center of the protuberance is a crater filled with a characteristic plug of soft, friable, keratotic material covered with an adherent, blackish-brown crust. This crater is quite different from the necrotic ulcer sometimes seen with epidermoid carcinoma.

Molluscum pseudocarcinomatosum has been reported from Europe, New Zealand, South Africa, Canada, and, very recently, the United States. Stewart reports that approximately one third of all instances of epidermoid carcinoma of the skin are in fact molluscum. It occurs with equal incidence in men and women. Apparently it has never been reported in any other than the white race. It occurs in the older age groups, chiefly the fifth to seventh decades.

Two cases of molluscum pseudocarcinomatosum of the lower lip are reported in which the correct preoperative diagnosis was made. Simple but complete excision of the lesion is the treatment of choice. Wide excision customarily performed for epidermoid carcinoma is unnecessary. Complete excision provides adequate tissue for pathologic study and effects a good cosmetic result. The untreated molluscum pseudocarcinomatosum regresses completely, often leaving an ugly, puckered scar.

Differential diagnosis and treatment of mycosis fungoides of the oral mucosa

(A szánjnyálkahártya gombás megbetegedéseinek osztályozása és gyogykezelése)

I. Miklós. *Fogorv.szemle* 48:193-195 Sept. 1955

Mycosis fungoides is a chronic disease with specific manifestations in the skin and membranes. Clinically, four types can be differentiated: (1) dermatitis with eczematic or mixed eruption; (2) infiltration with papular elevation; (3) tumorlike nodules, and (4) fungating ulceration.

In 50 patients with mycosis fungoides of the oral mucous membrane observed at the University Dental Clinic of Budapest, Hungary, superficial mycosis was established in 23 instances; systemic mycosis of reticuloendothelial cells in 25, and a general mycotic type in 2. The patients

were between 40 and 60 years old, and both sexes were about equally affected.

Probable, although not absolutely determinable, causes were as follows: malnutrition (in 16 patients); antibiotic therapy (in 8); periodontosis (in 7); faulty dentures (in 8), and different mycotic focal infections (in 4). In seven of the patients, however, the probable causative factor could not be determined.

Microscopically, the presence of blastomycetes was established in all instances; lymphocytes, plasma cells, multinucleated giant cells and connective tissue cells were found irregularly intermingled in 10 per cent of the patients.

Therapy consisted of general prophylaxis of the oral cavity, specialized treatment of the probable causative factors, vitamin medication and desensitization with autovaccines.

Caries and periodontosis in relation to the vital resistance mechanism weakened by disease: a biologic study

(Karies und Paradontose im Lichte der mangelnden Resistanz des kranken Menschen: eine biologische Studie)

Guido Fischer. *Schweiz.Zschr.Zahnhk.* 66:77-111 Feb. 1956

All pathologic manifestations in the human body are caused by disharmonies in the regulative and in the resistance mechanism, resulting in an increase in the susceptibility of the individual to various noxious agents whether they are of endogenous or exogenetic origin.

Such disharmonies, promoting caries or periodontal disease, can be established by biologic examinations of the teeth and the oral structures.

Disturbances in the chemicophysical equilibrium are the main cause of tissue abnormalities found in teeth susceptible to caries; mental disturbances, however, may cause periodontal defects observable in microscopic observations.

The percentage of persons afflicted with periodontosis is greater in mental institutions than outside.

As in general pathology, hereditary factors are often the principal if not the only cause for the presence of dental disease. In many studies of teeth and their surrounding tissue, especially in instances of malocclusion and malposition, it was established that the teeth were not affected clinically by caries or periodontal disease but that the characteristic pathologic symptoms could be determined only by histologic examinations.

It seems advisable, therefore, to evaluate the general health condition of the individual human organism by ascertaining the normal or abnormal functional ability of the masticatory apparatus. By reversing this procedure, the condition of the masticatory apparatus, including that of the dentition, can be evaluated properly from the condition of the individual health. Both considerations may serve as a valuable aid to sound diagnosis, prognosis and treatment planning.

The aggregation of physical and vital forces in the living human organism can be divided into three categories: (1) those agreeing with regular and established normal types; (2) monobasic, dibasic, tribasic, or tetrabasic acid types and (3) albuminate, caustic or volatile alkaline types.

In the normal and healthy body, the alkalinity of the blood is retained by the presence of a sufficient quantity of potassium and sodium salts.

In the acid type body, acidosis of the blood mainly of alimentary origin frequently can be established.

In the alkaline type body, acidosis of the blood may be caused by a prevalence of magnesium or potassium salts in the blood or by the presence of a combination of the two.

Persons of the acid type are predisposed to diseases of childhood; those of the alkaline type, to disturbances usually appearing in adult and senile persons.

Primary tuberculosis of the mouth

Editorial. *Brit.M.J.* No.4985:147 July 21, 1956

When primary tuberculosis appears in unfamiliar situations, such as the mouth, it is apt to be missed or misdiagnosed. As the primary ulcer in the mouth is usually small and painless, the patient may make no complaint, even if he is aware of its presence. Attention is drawn to the existence of tuberculous disease by the swelling of the related lymph nodes, most often those of the sub-

mandibular group. Injury to the oral mucous membrane is important in allowing the infection to become established. In a majority of the cases reported by Boyes and others there was a history of dental trauma by tooth extraction or alveolar abscess, but the injury may be trivial and unnoticed.

The primary focus is an ulcer in a tooth socket or on the gingiva or other part of the oral mucous membrane. The infection spreads rapidly to the regional lymph nodes which enlarge and are at first firm but later tend to soften and break down. The primary ulcer may be very small and may heal without trace while disease in the lymph nodes is still active.

To detect instances of primary oral tuberculosis, it is recommended that any chronic ulcer of the mouth that does not heal should be examined histologically. Primary tuberculosis should be suspected and an oral ulcer looked for when the submandibular lymph nodes are found to be enlarged.

Oral manifestations and treatment of pemphigus vegetans

Harry L. Levin. *Oral Surg.,Oral Med.& Oral Path.* 9:742-756 July 1956

Pemphigus, a rare and often fatal skin disease with oral manifestations, occurs in persons of all races and is about equally divided between men and women. Its more virulent forms are most commonly seen in Jewish people, particularly in Jews of Southeastern European origin.

The disease comprises several types; the most common is pemphigus vulgaris and the less common types are pemphigus foliaceus and pemphigus vegetans.

Pemphigus vulgaris in its most virulent form usually terminates in death from six months to one year after its onset, unless it passes into either the foliaceus or the vegetans types, which are not so fatal. The initial manifestation of pemphigus includes flaccid bullae that appear on the normal mucous membrane, break easily, and leave weeping, eroded and hemorrhagic surfaces. The fluid in the bullae is clear or straw colored, and later may become turbid or purulent. Mastication becomes seriously impeded; with extension of the inflammation into the larynx, hoarseness results.

Conservative treatment by the dentist with antibiotics and local palliatives is ineffective. If a favorable response is not forthcoming after several days, the dentist must lose no time in referring the patient to the internist or dermatologist. Usually the oral manifestations are associated with bullae on other surfaces of the body, especially the armpits, groin and genitals in the man, and under the breast and sometimes on the mucous membrane of the vagina in the women.

The oral mucosa is involved in all instances. The mouth is frequently the site of the first lesions. The lesions are usually severe and peripheral and eventually may involve the entire mucous membrane of the mouth, pharynx and larynx. The lesions from the oral cavity do not stop at the vermilion border of the lips, but continue to form excoriations on the chin, neck and front of the body; indeed, they may cover the entire body.

Pemphigus vegetans resembles pemphigus vulgaris in every respect, except for the vegetations which form secondarily on the excoriations. Vegetations on the mucous membrane of the mouth are rare; if they are present, they appear as soft, dark granulations.

The advent of ACTH and cortisone have revolutionized the treatment of all types of pemphigus. Although it may not save life, it prolongs life; remissions may last from several months to many years.

Agranulocytosis after insertion of tooth fillings containing arsenic

(Agranulocytose nach arsenhaltiger Zahneinlage)

Heinz Berg. *Deut.zahnärztl.Zschr.* 10:1481-1483 Nov. 15, 1955

In contrast to leukopenia, which is temporary, agranulocytosis (neutropenia) is a prolonged, severe reduction in the number of leukocytes and their precursors in the blood. This disease is characterized by a tendency to bacterial infection, particularly at the orifices of the body such as mouth, nose and anus. Bacteria, however, are secondary rather than primary factors. In addition to the reduction in the number of cells of the

granulocyte series, which may be considerable, there frequently is a reduction in the number of lymphocytes and monocytes. Slight hypochromic anemia often accompanies agranulocytosis. The condition of the bone marrow varies, but the lack of maturation of granulocytes, particularly myeloblasts, is important.

In many instances, the cause cannot be determined. In the case reported, however, the cause was clearly established.

The patient, a 46 year old woman, almost immediately after the insertion of two tooth fillings which contained arsenic, experienced severe symptoms of agranulocytosis which endangered her life. The coincidence of the insertion of two fillings containing arsenic, a 19 day duration of the poisonous effects of arsenic deposits, and the appearance of agranulocytosis seems to prove that the patient had an idiosyncrasy to arsenic. Control tests revealed that no other possible causative factors were present.

Besides antineuralgics such as aminopyrine or sulfonamides, tooth fillings containing arsenic can be etiologic factors in agranulocytosis, especially if an allergy against arsenic is present.

A report of a case of an unusual embryologic defect of the face

Hugh Gibson Beatty. *Plast.& Reconstr.Surg.* 17:297-303 April 1956

A three and one-half month old male baby had the following abnormalities: accessory mouth, with contents, springing from the right mandible; and a right anophthalmia and left polycystic kidney.

The accessory mouth was at the angle of the right side of the mandible. This mouth had well-formed lips with a normal vermilion portion. The alveolar process was circular in formation; at one place there appeared an irregularity which seemed to be a premaxillary bone. The oral cavity contained a tongue, rather tubular in shape, but of normal tongue tissue. There was mucous secretion in the cavity and apparently salivary secretion.

The present example of facial deformity involving an accessory mouth and tongue is regarded as belonging to the category of developmental excess in which there occurred a partial duplication of the right mandibular process of the first visceral or branchial arch.

The alveolar process of the supernumerary mouth was complete except at the upper outer angle where there was a small, movable mass which to some extent simulated the premaxillary bone in the main mouth. The accessory oral opening measured about 4 cm. transversely and 3 cm. vertically. The tongue was movable and tubular in shape. The frenum was in the normal place, and the center of the tongue consisted of a channel. The upper border of the supernumerary mouth joined the angle of the real mouth and caused a slight separation of 1.5 cm. at the border of the lower lip. When the normal tongue was protruded, at times the supernumerary tongue was protruded. The right true alveolar arch was distorted, tilted inward and formed an irregular occlusion.

A second examination at the age of 19 months revealed teeth in the accessory mandible which were apparently normal and were erupting as in a normal mouth. The teeth on the right side of the true mouth were irregular. The teeth in the accessory mouth were perfectly formed specimens and were identical with the teeth which would ordinarily be expected to be formed in the respective regions of a normal mouth.

The management of the problems presented by the patient are described.

Tuberculosis in the oral cavity

(Zur Frage der Tuberkulose der Mundgebilde)

Karl Balogh, Budapest, Hungary. *Österr.Zschr. Stomat.* 52:561-570 Nov. 1955

Tuberculosis of the mouth may occur as an extension from lupus tuberculosis, or as miliary conglomerate tubercles which usually are superficial and tend to ulcerate.

Except for the frequent appearance of tuberculous lesions on the tongue, tuberculosis is rare in other parts of the oral cavity. When it occurs, the gingiva and the soft palate mainly are affected. These types of tuberculous lesions are almost always secondary to pulmonary tubercu-

losis, sometimes localized in the oral cavity as a result of extreme abrasion such as is produced by carious teeth. Often, the presence of tuberculosis in the oral cavity calls attention to the existence of the pulmonary disease.

Gangrenous teeth, periodontal pockets, fractures of jaws or teeth, sharp-edged teeth or roots, and faulty dentures facilitate tuberculous infections. The self-disinfecting property of the oral cavity, the mechanical cleansing effect of mastication, and the enzymes and bactericidal constituents of the saliva, however, serve as preventive factors against respiratory and alimentary infection. A secondary tubercular infection can be caused by a continuous extension of processes in the vicinity of the mouth, by hematogenic spreading or by infection by Koch-positive sputum. Secondary tuberculous lesions then appear on the gingiva, palate or jaws.

The dental condition of tubercular patients does not differ from that of others. Around the carious teeth and roots, however, *Mycobacterium tuberculosis* is identifiable. Therefore, immediate treatment of carious lesions and the practice of oral hygiene are important steps in the prevention of tuberculosis in the oral cavity.

Problems of maxillofacial and oral surgery

John Hertz, Stockholm. *J.Internat.Col.Surgeons* 26:63-79 July 1956

Problems in the field of maxillofacial and oral surgery can be divided into three main groups. The first comprises problems respecting which the dentist has the most responsible task; the second, problems in which the physician or the surgeon has the main responsibility, and the third, conditions which call for the cooperation of dentist and surgeon on equal terms.

The dentist bears chief responsibility in diagnosing oral precancerous lesions. He must have a thorough knowledge of those changes in tissues which at any time may assume the character of a malignant tumor, but which may remain unchanged for a considerable time, especially if irritation can be avoided. The problem of irritation has passed into a new phase, since it has been proved that the development of cancer passes through two stages: the change of the normal cell (a latent malignant transformation) and the initiation of malignant proliferation. A long period, even decades, may pass between the two phases.

Since the oral mucous membrane is extremely sensitive, the patient will early detect any changes and will seek the advice of his dentist. The dentist, during the patient's regular visits for routine examination, may inspect and palpate the whole of the oral cavity in a few minutes, without giving rise to any form of cancerophobia.

Among important oral precancerous conditions which the dentist may encounter are the erythroplasias and the leukoplakias, certain atrophic changes associated with the Plummer-Vinson syndrome, and the oral decubital ulcer.

The dentist must also participate directly in the treatment of tumors of the jaws; he must operate on odontogenic cystic growths. Other diagnostic problems which the dentist will encounter include the epulides and giant cell tumors. The position and responsibility of the dentist in the whole field of cancer prophylaxis are most important. Negligence here costs dearly and cannot be made up.

Among the conditions which call for the cooperation of dentist and surgeon on equal terms are oral sepsis, focal infection, lesions of the trigeminal and facial nerves, diseases of the temporomandibular joint, and fractures of the jaw.

The surgeon bears main responsibility for complications resulting from inadequately treated inflammatory lesions around the teeth, and the treatment of oral carcinoma.

Histologic research on dental fluorosis in Isparta, Turkey (Considérations et recherches histologiques sur la fluorose observée chez les habitants d'Isparta, Turquie)

Suat Ismail Gurkan, Istanbul, Turkey. *Rev.mens.suisse odont.* 66:582-584 June 1956

The Institute for Dental Pathology and Oral Surgery of the University of Istanbul, Turkey, has published a report on dental fluorosis observed in inhabitants of Isparta, a Turkish province with a capital of the same name (formerly Hamidabad).

The problem of dental fluorosis has been mentioned frequently in articles appearing in international dental literature, especially in American and Swiss periodicals. It was assumed that fluorine intoxication is the direct cause of mottled enamel. Animal experiments have established that when drinking water from communities where fluorisis is frequent is added to the normal diet of animals, the symptoms of fluorosis appear. These symptoms probably are promoted by the reduction of normal enamel pigment causing a direct and disturbing effect on the enamel epithelium in the midsection of the teeth which then is active in the formation of the dull, chalky white enamel defects.

The drinking water of the province and city of Isparta originates in deep wells and contains from 1 to 7 ppm fluorine.

It is possible, although not probable, that in isolated instances dental fluorosis is hereditary. The appearance of brown and chalky white mottled teeth in various individuals differs widely. Some teeth have paper-white spots, others are striated, and still others show ridges transversally positioned. In most persons, the surfaces of the teeth are glazed and smooth. The mottling occurs prominently on the labial surfaces of the incisors.

The histologic evidence obtained in the research on dental fluorosis in Isparta is almost identical to that revealed by other researchers in this special field, especially to the results recently obtained in Varna, Bulgaria.

Experimental studies on the changes in the calcified tissues and kidneys after the long term administration of sodium fluoride

(Fukka-soda no renzoku-toyo niyoru kososhiki oyobi jinzo no henka nitsuite)

Motomasa Arai. *J.Japan Stomat.Soc.* 23:1-12 March 1956

To obtain more knowledge on the systemic action of fluoride, experimental studies were directed toward the general changes in jaws, lower extremities and internal organs after prolonged administration of fluoride in large amounts. Fifteen pregnant rats received sodium fluoride, about 10 mg. daily per os. Their litters were fed successively in the same manner as the mothers. After 250 to 300 days the animals were sacrificed for microscopic study. Histologic examination showed substantial changes in the teeth, especially in the enamel of the incisor, and a severe contracted kidney accompanied by hypertrophy of the parathyroid glands and bone change similar to diffuse fibrous osteodystrophy. The renal change associated degeneration and atrophy of the tubules with proliferation of the interstitial connective tissues and cystic dilatation of the tubules. The glomeruli showed inconspicuous changes but no change was demonstrable in the blood vessels. It was suggested that the hypertrophied parathyroid glands play some role in this because of the frequent appearance of dark chief cells. Slight atrophic changes were noticed in other endocrine glands. Although it is known that trinal intoxication is caused in bones, kidneys and parathyroid glands, by some metals, and despite general acceptance that fluoride has some direct action on the bone tissue, the severe changes in kidneys and parathyroid glands caused by fluoride administration indicated that skeletal change in these instances might be induced by primary damage to the kidneys and parathyroid glands.

Syphilis: review of the recent literature

Herman Beerman, Ira L. Schamberg, Leslie Nicholas and Marvin S. Greenberg. *A.M.A.Arch.Int.Med.* 97:215-241 Feb. 1956

Whether syphilis is still an important health problem is a moot question. Indications are that the trend to relegate syphilis to limbo is growing, in spite of the evidence produced by the "die-hards" that late syphilis is an ever-increasing problem and that there are many urgent current needs that demand attention.

A major cause of the decline in the incidence of syphilis is penicillin therapy, which was introduced in 1944. The World Health Organization, on the tenth anniversary of the introduction of penicillin therapy for syphilis, noted that although the disease had become much less serious in some countries in the past ten years, it

was still an important public health problem in many other countries. There are about 20,000,000 persons with syphilis in the world today; in areas of certain countries as much as 80 per cent of the population may be affected (Africa, Southern Asia, Egypt, Ethiopia and India).

Whereas the general medical practitioner is not usually consulted until symptoms of syphilis appear, the dentist sees people who are, for the most part, apparently healthy. The dentist is often the first to see pathologic changes in the body, according to Pinckney. The dentist has a moral obligation, therefore, to participate in public health programs for the detection of latent diseases. Among diseases which might be seen first by the dentist are tuberculosis and syphilis, especially congenital syphilis.

The literature shows that the dentist can be of great value in the detection of that condition. That he is not is the result of his failure to recognize his potentialities in this respect.

Of the 7,459 instances of congenital syphilis discovered in California in 1952, at least half of them might have been discovered previously by dentists because of the presence of oral pathologic findings. Yet there is no record of syphilis having been discovered by a dentist.

Dental coalescence (Coalescências dentárias)

F. Henriques Vaz. *J.estomat., Lisbon* 2:15-16 Oct.-Nov. 1955

Dental coalescence is rare. The case reported is the seventh in world literature, and it was observed in a man 24 years old.

The patient was an only child. His mother was dead, but she had had normal teeth. The patient's father was edentulous when seen, but he stated that he had had the same dental abnormality that his son exhibited.

The deciduous and permanent dentitions had erupted at the usual ages. The deciduous teeth had been normal. Supernumerary permanent upper lateral incisors had appeared with the permanent dentition. They were in coalescence with the permanent upper central incisors. Both the supernumerary coalescent lateral incisors and the normal lateral incisors on each side were of normal structure and size and were exactly like each other. The coalescent upper central incisors were also normal in structure, but they were smaller in size than normal adult upper central incisors. The coalescent teeth formed one unit, but there was a faint line of division between them. This line ended with a slit on the cutting edges of the teeth. Both the line and the slit were well demarcated on the teeth of the left side but had disappeared from those of the right side.

Roentgenographic examination of the coalescent teeth showed complete formation of both teeth, each of which had its own pulp chamber and its own normal pulp of normal size. Homogenization of the enamel, dentin and cement was complete.

Dental coalescence has been explained as being the result of either separation of a dental follicle in two or three parts or of the fusion of two or three dental follicles. In either instance, bigemination or trigemination occurs (1) when the follicle is the target of intrafollicular or extrafollicular pressure from trauma, or (2)when the follicle is injured by the effects of local or systemic infection or changes in the endocrine metabolism. In the case reported, bigemination of the upper incisors (normal and supernumerary) had taken place prior to calcification. The abnormality was bilateral, symmetrical, mixed (it included enamel, dentin and cementum) and normo-supernumerary (it took place between a normal and a supernumerary tooth). The diagnosis was made on the basis of these characteristics.

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Metallurgy

Transformations in disordered gold-copper alloys

G. C. Kuczynski, M. Doyama and M. E. Fine. *J.Applied Physics* 27:651-655 June 1956

By measurement of the specific heat, temperature coefficient of expansion, Young's modulus and yield point, it was established that the copper-gold alloy undergoes a phase transition between 550° and 600°C. and possibly another one near 850°C.

Oral surgery

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Roentgenology

Sialography—a valuable diagnostic method

Robert Ollerenshaw and Sidney Rose, Manchester, England. *D.Radiog.&Photog.* 29:37-46 No. 3, 1956

Nonacute and especially recurrent swellings, particularly those of the parotid gland, are the most common lesions of the salivary glands to be seen by the dental surgeon. Sialography—the roentgenographic demonstration of the salivary ducts by means of the injection of substances opaque to roentgen rays—is valuable in diagnosing such swellings, provided the underlying anatomy is understood.

Routine roentgenograms are made before sialography to determine the presence of calculi and calcified glands.

A 5 cc. syringe is fitted with a special cannula, made from a blunted intravenous needle which has been angled to about 140 degrees and on which a stopper has been formed by a blob of solder. The needle for the parotid duct has a short straight portion distal to the stopper (Fig. 1). This position of the stopper limits the distance which the cannula can enter and thus prevents impingement on the wall where the duct passes at an angle through the buccinator muscle (Fig. 2).

The patient sits opposite the surgeon, with an assistant steadying the head. Gentle eversion of the cheek between thumb and finger reveals the orifice of the parotid duct opposite the second upper molar. Massage, or a mouthwash of 0.5 per cent hydrochloric acid, stimulates the flow of saliva and makes identification easy. The cannula is inserted gently in the line of the duct and slid inward until the stopper impinges on the papilla. The stopper prevents a return flow of the contrast medium during the injection. On completion of the injection the cannula is removed and a small swab placed over the orifice to mop up any overflow which would otherwise spoil the roentgenogram. The swab is removed before the exposure is made. Excellent roentgenograms can be obtained up to 20 minutes after injection.

The orifice of the submandibular duct is not so easy to locate because it is situated on the tip of a mobile papilla which must be fixed by blunt forceps before cannulation is attempted. When

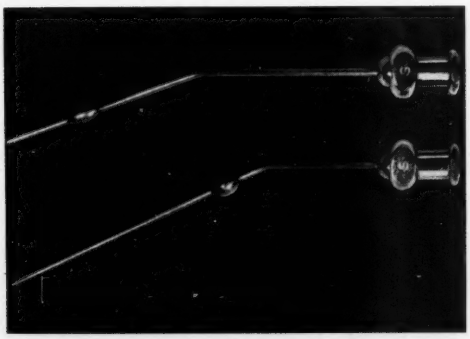

Figure 1 Intravenous needles, blunted and angled for sialography. Note the positions of the solder stoppers and the angulation. Above: For the parotid duct. Below: For the submandibular duct

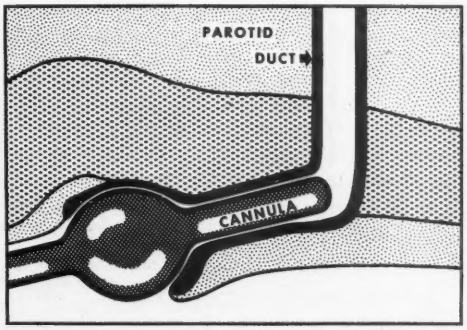

Figure 2 The parotid duct turns sharply through the buccinator muscle. The stopper on the needle seals the opening and holds the tip away from the duct wall

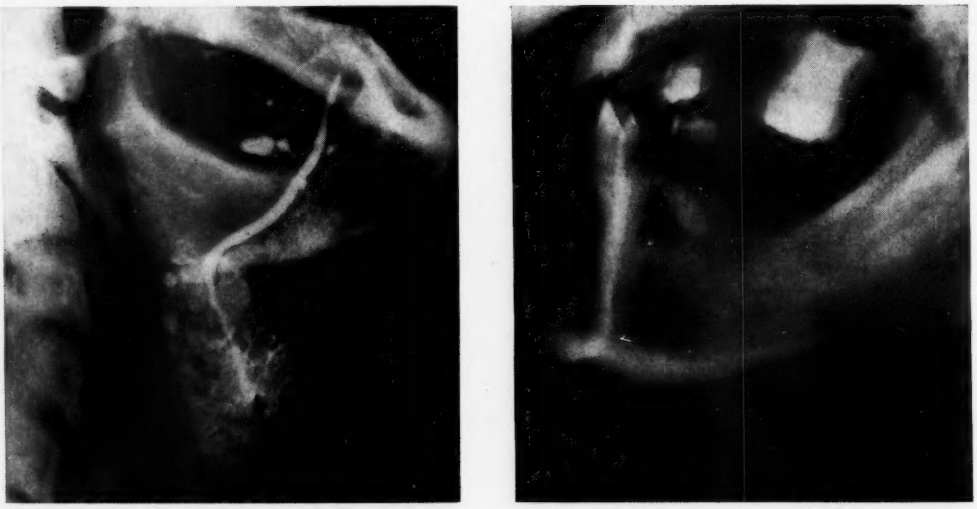

Figure 3 The lateral-oblique projection is best for obtaining an image of the submandibular gland. Left: Lateral-oblique projection of a normal gland. Right: Lateral-oblique projection of a submandibular calculus

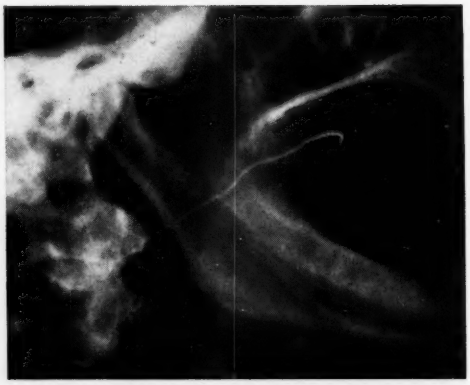

Figure 4 Lateral projection of the submandibular gland provides a roentgenogram that is easy to read. This is a normal parotid sialogram

the papilla is kept gently taut in the line of the duct, the long cannula will enter easily as far as the stopper, which again acts as a seal. If necessary, a lacrimal duct dilator of suitable size can be used to dilate the duct orifice before cannulation.

Experiments conducted by the authors show that the parotid gland will tolerate pressures up to 400 mm. of mercury (the amount produced by the thumb firmly applied to the piston of the syringe) without discomfort and that the volume of injection required for this gland is at least 2 cc.

For the submandibular gland, the lateral-oblique projection is the best, for the image of the gland is thrown clear of the ramus of the jaw (Fig. 3). The true lateral projection is also of value, as in it the duct pattern is undistorted. For the parotid gland the true lateral projection provides a roentgenogram that is easy to read (Fig. 4).

The majority of recurrent enlargements of the parotid gland can be classified as (1) simple duct obstruction, (2) recurrent nonobstructive and obstructive parotitis, and (3) "chronic" parotitis. The lesions of the submandibular gland are relatively simple to diagnose and treat. This gland is the site of tumor or calculus. Because of the shorter and wider duct system of the submandibular gland, infections are rare. Twenty-seven roentgenograms and photographs illustrate the clinical aspects of the various lesions of the salivary glands.

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Surgical technics

Conservative surgery in instances of adamantinoma: adoption of the "new look" method (La chirurgie conservatrice dans les adamantinomas: application du procédé "new look")

R. Bataille. *Rev.fraç.odontostomat.* 6:705-715 June-July 1956

Adamantinoma occurs frequently in the jaws, especially the mandible, but it appears also in other regions such as in the hypophysis or in the tibia.

In the region of the jaws, this tumor may attain large size; it can be solid or cystic and it is locally invasive. Relapses after surgical removal are frequent, but metastases are rare.

Microscopically, the cell nests and masses resemble ameloblasts.

Clinical examination seldom is sufficient to form a safe diagnosis. Roentgenographic and microscopic examinations are essential. Anatomicopathologic investigation should precede the decision as to whether to attempt surgery. "In a number of instances, diagnosis is formed from an ensemble of symptomatic possibilities instead of from a certitude."

The choice of the correct surgical method often is difficult. Hemisection of the tumor in the region of the jaws may prevent recurrence, but it will injure the patient severely. Partial resection and intensive scraping often obtain favorable functional and esthetic results, but these operations are followed by an alarming percentage of relapses.

This new and conservative surgical method, termed the "new look," permits more and lasting favorable results. This technic is a modification of hemisection and scraping, and it is a serious and complicated surgical procedure. It must be prepared carefully and performed skillfully. All cavity walls must be closed immediately after surgery.

The "new look" method can be called conservative because it aims to preserve the integrity of the bones, especially that of the ascending rami, temporomandibular joints and basal ridges. A postoperative control for at least one year is necessary.

In all cystic forms of adamantinoma of the jaws, conservative surgery is the method of choice. In extreme instances, however, a complete removal of the tumor is indicated, even if such a procedure mutilates the patient's face.

Giant osteochondrofibroma of the right maxillary bone (Un caso de osteo-condro-fibroma voluminoso del maxilar superior derecho)

A. Hakim Dow and O. Mendez Morales. *Rev.Fed. odont.Colombiana* 6:111-126 July-Aug. 1955

A 19 year old man requested surgical intervention for the removal of an enormous tumor which occupied the entire right half of his face. The tumor had appeared and started to grow ten years prior to consultation. When the patient was observed for the first time, the tumor was about 11 cm. in diameter and was hard on palpation. The skin over the tumor and the buccal mucosa were normal. Intraoral examination showed that the tumor was entirely formed by the hard palate and the right upper alveolar process. Roentgenographic examination of the right maxillary bone showed a lesion which had expanded the bone so that it was impossible to identify the maxillary sinus. A preoperative diagnosis was not made. Total resection of the right maxillary bone after ligation of the external carotid artery was decided on.

The tumor was approached from the cheek. After anesthesia with thiopental sodium and intratracheal intubation, a Fergusson incision was made that extended to all the tissues of the cheek that were used for a cutaneous flap. Hemostasis was secured with electrocautery. The resection technic used was the same as that commonly used for resecting benign osteogenic tumors of the right maxilla.

Chisel and mallet were used for resection of the palate. The resection followed the line that divided the healthy from the tumorous region of the bone up to the posterior edge of the palate. The zygomatic arch was sectioned with Gigli's saw, the affected bone was removed with shears

and hemostasis was secured. A skin graft from the patient was applied to the bleeding surface of the cutaneous flap and sutured to it. The cavity was packed with iodoformized gauze, which was loosely secured to the flap by means of silk sutures. The flap was then replaced over the cavity and sutured in place. The patient was given analgesics and antibiotics and was fed for several days through a nasoesophageal tube (Netalon no. 16).

The postoperative course was uneventful. The surgical specimen included all the massive portion of the right upper maxillary bone, two thirds of the palate bone, and a portion of the malar bone in its articulation with the zygomatic bone. Histologically, the tumor was benign. At the end of a few weeks, healing was perfect. The flap had begun to retract, but this retraction was checked by applying a skin graft over the mucosal side of the cheek. The patient was seen several weeks later. His mouth opened into the nasal fossae. Phonation was poor, and the patient could neither chew nor swallow solid food. In the left maxilla were the second bicuspid and all three molars, a small portion of the alveolar ridge corresponding to the lateral incisor, and the remaining portion—one third—of the palatal bone. Roentgenographic examination showed that all the teeth in the dental arch and the regional soft and hard tissues were healthy and strong. A prosthesis for reconstruction of the face and mouth was prepared as follows:

1. Cast crowns were fixed to the remaining teeth of the left maxilla.

2. An impression of the crowned teeth and of the small portion of the alveolar ridge was made by means of a metallic impression tray with a flat bottom prepared with alginate. When the end of the portion of alveolar ridge in the left maxilla was reached, modeling compound was added to the right side and it was evenly distributed over the entire side until the right cheek was completely distended. Wax was added to the palatal region near the area occupied by the modeling compound. The impression was then made by exerting only moderate pressure.

3. From this impression a model in chalkstone was made and on it the alveolar ridge and the portion of the palate near the alveolar ridge were reconstructed with hard wax and paraffin. The destroyed dental arch was reconstructed by Hawley's geometric parabolic procedure.

4. A plate for the left maxilla was designed and made in chrome-cobalt. It was provided with clasps for the crowned teeth, occlusal rests properly distributed on the surfaces of the teeth, special tissue-borne connectors, and a metallic network, which was combined with acrylic resin, along the edentulous region up to the external free end of the reconstructed alveolar ridge. The network covered also the palatal vault from which all soft and hard tissues were missing.

5. A baseplate was prepared. The vertical distance was increased by adopting the circular pad, and an impression was then made of the lower teeth.

6. The upper model was then transferred to the articulator, the centric and protrusive relations were fixed, and the teeth for the prosthesis selected.

7. The articulation was tested after the reconstructed alveolar ridge and the missing portion of the palate (previously made in hard wax and paraffin) were placed within the paraffin side of the baseplate and the network.

8. Flasking and treatment of the denture were carried out as for partial dentures (six hours of treatment).

9. An impression was then made with soft wax of the space left by the removed portion of the maxillary bone. The alveolar ridge and the palatal region (previously made with hard wax and paraffin) served as a base. From this impression a piece was prepared which covered the orifice of the palate, corresponding to the maxillary sinus up to the level of the nasal fossae. The space which corresponded to the contour of the face for replacement of the portion of maxillary and malar bones was then included in the piece.

10. Flasking and treatment of the obturator were carried out. Soft acrylic resin was used in making the obturator. It was slightly hollowed so as to lessen its weight, and it was adapted to the artificial denture. The obturator and the artificial denture were combined by means of self-curing acrylic resin. The frenum of the upper lip

was cut to give greater freedom of movement to the lip during use of the prosthesis.

The prosthesis was fitted and its function checked at intervals of one, two and three weeks. The cosmetic and functional results were satisfactory. Later plastic surgery may improve the cosmetic aspect of the patient's face.

The use of gold plate for the closure of oro-antral fistulas

William E. Crolius. *Oral Surg.,Oral Med. & Oral Path.* 9:836-838 Aug. 1956

Closure of an oroantral fistula should always be tried first by means of a 24 carat gold metal plate. This method of treatment is painless, causes a minimum of discomfort, enables the patient to wear a denture and is easily accomplished. Gold plate is superior to other metals in its malleability, softness and ease with which it can be annealed. The oral fistula should not be closed until the antrum infection has been controlled. Polypoid or cystic tissue should be removed from the sinus by curettage, a nasal window should be constructed for irrigation and drainage and the proper antibiotic should be prescribed.

Should the side containing the fistula be edentulous, an incision is carried along the crest of the alveolar ridge, bisecting the fistula. The incision should extend at least 1 cm. on either side of the bony opening. If teeth are present on either side of the opening, the gingiva around the necks of the adjoining teeth should be freed on both the buccal and lingual sides to get adequate exposure. The soft tissue is then undermined with periosteal elevators so that, when it is retracted, the opening into the sinus is well exposed. All granulation tissue surrounding the region is removed down to the healthy bone.

A piece of 24 carat, 36 gauge, gold plate is cut to a size sufficient to overlap the opening in the bone by 2 or 3 mm. around its entire circumference. The gold is annealed by heating it until it is cherry red and quenching it in water. It is then laid over the opening and burnished down snugly against the bone. The tissue flaps are returned to place over the gold and held in place without tension by several no. 000 silk sutures. No attempt is made to pull the tissue flaps into apposition, and all during the healing process the gold is easily visible. Sutures may remain for about one week or until they appear to have lost their value.

In most instances, from three to four weeks is required for healing, at the end of which time the gold is loose and is easily removed. The tissue on the oral or outer side does not close over, but beneath the gold on the sinus side a bridge of healthy tissue will form to close the opening. After the gold is removed, the remaining tissue flaps heal readily. The patient should be instructed to avoid blowing the nose or playing with the region of the fistula with the tongue during the healing period.

Removal of root from the maxillary sinus

J. H. Johnson. *J.Ontario D.A.* 33:22-23 June 1956

Routine roentgenographic examination of an 85 year old woman revealed a root tip in the left maxillary sinus which apparently had been displaced there 12 years previously and had remained symptomless. There was no discomfort or discharge, and roentgenographic and transillumination findings were normal. Although the patient was told that an operation was not necessary, she insisted on removal of the root tip.

The ambulant patient received 300,000 units of procaine penicillin intramuscularly one hour before operation and 1.5 grains of pentobarbital calcium 30 minutes before operation. After block anesthesia, a mucoperiosteal flap was raised, that extended from the tuberosity to the cuspid. With the tissues widely retracted, a window was made through the lateral wall of the antrum high up in the fold in the region of the first molar. The patient's head was then inclined sharply to the left so that the antral window was the most dependent part of the sinus. A large kidney basin was held at the corner of the patient's mouth. The root was then flushed from the sinus without difficulty, using warm, sterile saline and a bulb type of antral lavage. Visual inspection showed that the antral membrane was healthy and the sinus free from infection. The flap was closed by suture and without a drain. The patient was given vaso-

constrictive nose drops to shrink the osteum, and a therapeutic penicillin level was maintained in her blood for 48 hours postoperatively. Healing was uneventful.

This method of recovering root tips from the maxillary sinus is certain in results, produces a minimum of nerve trauma and does not result in oroantral fistula. It has much to recommend it over other advocated procedures. The intra-alveolar approach is uncertain in results, is difficult to close if extensive access has been gained and often results in oroantral fistula. The classical approach through the canine fossa invariably leads to extensive destruction of the anterior superior maxillary nerve, with resultant loss of sensation in a number of teeth and occasionally in a "dropped lip."

The use of zirconium metal plate in arthroplasty of temporomandibular ankylosis

Tadashi Ueno, Ishi Miura and Hitoshi Kohno. *Bul.Tokyo M.D.Univ.* 2:137-139 Sept. 1955

In the surgical treatment of temporomandibular ankylosis, important factors include the free movement of the new condyle, and prevention of its reunion and dislocation after the operation. Many authors interpose soft tissues between the reconstructed joint. Recently, tantalum and Vitallium have been used as capping material, chiefly because of their nonelectrolytic property. Two cases involving the use of a zirconium condylar cap, applied immediately after condylectomy, are reported.

A 12 year old girl suffered from complete ankylosis of the mandible, with a birdface. Roentgenographic examination revealed an osseous union of the left temporomandibular joint and depressed development of the lower jaw. An arthroplastic operation was performed under local anesthesia. The bony union was excised by chisel about 5 mm. wide to obtain free movement of the lower jaw. A zirconium cap, 20 by 15 mm., was formed to cover the condyle. Recovery was uneventful. The opening between the incisal edges of the upper and lower anterior teeth was 23 mm. Subsequently a similar operation was performed on a 20 year old woman, with equally satisfactory results.

It is desirable to interpose a nonirritating material after osteotomy for temporomandibular ankylosis. Zirconium is admirably suited to this use because it is nonirritating and stable, and practical for use in living tissue.

▼ Extractions

Removal of impacted teeth

A. Wade Smith. *Arkansas D.J.* 27:5-10 June 1956

An impacted tooth is removed for the following reasons: (1) to prevent damage to the adjacent teeth and their surrounding structures; (2) to prevent chronic pericoronal infection, especially in the mandibular third molar region, and (3) to prevent malpositioning of other teeth by the eruptive force of the impacted tooth.

The follicular membrane surrounding the crown of an impacted tooth tends to become cystic and expand, with resultant damage to the adjacent bone and teeth. The pressure of the crown of an impacted tooth and the expansion of the membrane against the roots of other teeth often causes resorption of the roots of the erupted teeth and shortens their span of usefulness. The destructive process may occur so insidiously that the patient is unaware of its existence. Practically all impacted teeth eventually cause sequelae; the ideal time to remove them is before they become symptomatic.

The most important factor governing the success in removing an impacted tooth is an accurate diagnosis. Sharp roentgenograms and the use of occlusal views supplemented by the parallax technic are essential. Factors to be considered are the position of the impacted tooth in relation to adjacent teeth and such vital structures as the mandibular canal and maxillary sinus; bone density; thickness of overlying bone; shape of the roots; size of the orifice, and the temperament of the patient.

The incision for removal of the impacted mandibular third molar should curve laterally at the distobuccal angle of the second molar; this compensates for the fact that the ramus distal to the third molar deviates laterally. Angling the incision at this point creates a three cornered flap and enhances tissue retraction during the procedure.

The removal of an impacted left mandibular third molar in the mesioangular position is described, and illustrated photographically and roentgenographically.

The patient receives an instruction sheet covering postoperative home care. Medication to combat pain usually is begun before the patient leaves the office.

The patient should return for routine postoperative care. Sedative dressings are essential if the socket becomes painful because of loss of the blood clot. A suitable obtundent dressing placed in the socket usually brings dramatic relief within minutes, and often produces comfort for from 24 to 48 hours. The wound may have to be dressed at 24 hour intervals, after which the intervals may be extended to 48 or 72 hours. Dressings are continued until the socket has ceased to be sensitive, after which the socket is irrigated periodically with a warm saline solution to maintain good oral hygiene. The patient should be observed until the soft tissue is healed.

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Anesthesia and analgesia

The effect of storage on procaine-epinephrine solution

Emmett R. Costich. *Anesth.&Analg.* 35:357-362 July-Aug. 1956

Two per cent procaine solutions with and without 1:50,000 epinephrine added were assayed by chemical and biologic methods to determine their ability to maintain biologic activity during long periods of storage.

Discolored 2.0 per cent procaine-1:50,000 epinephrine solutions were found to produce anesthesia of shorter duration than clear solutions.

The pH of procaine-epinephrine solutions remained within accepted limits when remaining clear even though stored for as long as 54 months.

Epinephrine at the concentration and under the conditions used in dental anesthetic solution has a relatively short shelf life.

No adverse effects were observed in animals or man when discolored solutions were tested.

It appears that the discoloration which occurs in such solutions during storage is the result of the oxidation of the epinephrine. The only disadvantage encountered from the use of discolored procaine-epinephrine solution was the fleeting nature of the anesthesia; it was comparable to that obtained with procaine without epinephrine.

Factors governing the efficacy of local anesthetics

Stanley C. Harris. *Proc.Inst.Med.Chicago* 21:92-93 July 1956

Factors contributing to the efficacy of dental local anesthetics include the physicochemical characteristic of the anesthetic compound, the use of appropriate vasoconstrictors and vasodilators, success in avoiding injection into a blood vessel, accuracy in placement of the solution, and psychology.

In animal and human experiments and clinical investigation, 2 per cent lidocaine hydrochloride, 3.8 per cent metabutethamine hydrochloride and 2 per cent procaine hydrochloride with conventional quantities of a vasoconstrictor are significantly more potent dental local anesthetics than 1, 2 or 4 per cent procaine hydrochloride with epinephrine, 2 per cent lidocaine without epinephrine, 2 per cent procaine hydrochloride plus 0.15 per cent tetracaine hydrochloride plus 1:30,000 *l*-arterenol and 2 per cent procaine hydrochloride plus 0.15 per cent tetracaine hydrochloride plus 1:10,000 nordefrin hydrochloride. The latter two compounds induce dental anesthesia of significantly longer duration than the other two compounds cited.

Local anesthetic agents are all local vasodilators (except for cocaine) and require supplementation

with vasoconstrictors to enhance their potency and duration. Excessive concentration of vasoconstrictor may reduce potency completely by restricting diffusion of the anesthetic from the deposition site to the target. Anesthetic potency may also be reduced substantially when injection is too rapid or with excessive pressure, since each nullifies the vasoconstrictor benefit.

Another significant cause of anesthetic failures (and untoward effects) is inadvertent injection into a blood vessel. In a series of 3,175 injections, aspiration occurred 103 times (3.2 per cent). The specific incidence was as follows: zygomatic, 6.4 per cent; mandibular, 3.3 per cent; infiltration, 2.2 per cent, and all other injections, 4.7 per cent.

The tendency of a standard hypodermic needle to be deflected as it passes through tissue often places the anesthetic compound as much as 5 mm. from the intended point. This tendency may be minimized by using shorter, larger gauge needles with symmetrical (Huber) points.

The attitudes of the operator and the patient to the local anesthetic are factors contributing to its success or failure.

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Miscellaneous

Operations for harelip and cleft palate: the emotional complications in children

J. P. Kahn. *California Med.* 84:334-338 May 1956

The emotional complications in children resulting from operations for cleft lip and cleft palate are largely a part of the general considerations of operation and anesthesia in children.

The mother who has born a child with cleft lip or cleft palate may feel (erroneously) that she is to blame—particularly if she did not wish the pregnancy and tried to disrupt it. The professional persons who assist in her delivery can in some measure lessen these guilt feelings in the mother by reassuring her that it is erroneous for her to think she is responsible for the child's deformity, and that the corrective operation will improve the defect and the child's facial appearance. The physician should refer a mother for psychiatric help if strong guilt feelings continue.

Surgical operations are frightening and upsetting to a child. The unfamiliar preoperative procedures, the strange surroundings and the parental anxiety combine to make the child feel that something terrible is going to happen. If the child is old enough to talk and understand, the physician and the parents should inform him of what is going to happen and what he will feel. The child should have the opportunity to discuss the products of his imagination about the operation and have them corrected by someone he trusts. Both before and after the operation the child should be helped to verbalize and to "play out" his ideas about and his emotional reactions to the operation.

Determining the optimal time for carrying out an operation on a child is an individual matter involving study of the child in his past and present background, preparation before the event, avoidance of separation anxiety, and psychiatrically oriented support and facilities for expression of feeling.

Theoretically the defect or defects should be repaired as early in life as possible, compatible with the physical safety of the child and the minimization of emotional trauma. It may be desirable, whenever possible, to correct a cleft palate before definite speech patterns have formed, for speech patterns are likely to be less defective and speech training more effective. Also, the greater closeness of the child-mother unit when the child is very young may insulate against too harmful emotional effects of an operative procedure. Balanced against these considerations, however, is the fact that at a later age—say three years—the child's ability to cope with anxiety is better; his understanding is greater, and the possibilities of minimizing emotional trauma by verbalization and "playing out" are increased.

It is an advantage to the surgeon to have a child psychiatrist minimize the traumatic emotional impact of the operation on child and parents. The surgeon should also see that all hospital personnel concerned with the child are similarly interested in the kind of management of the child that will insure maximum benefit and minimal emotional trauma.

A tooth in the lung (Dens in Pulmone)

Karl Buschinger. *Deut.zahnärztl.Zschr.* 10:1302-1304 Oct. 1, 1955

The inhalation of pus or blood or an unnoticed entry of a foreign body into the trachea or the bronchi can lead to severe complications such as the development of pulmonary abscesses or growth and gangrene of the lung.

All dental interventions, especially those performed under anesthesia, should be executed with the utmost care and watchfulness because unconscious inhalation of foreign bodies may occur easily.

In the case reported, the dentist was repairing a difficult fracture of the mandible which had occurred in an accident. By chance, the dentist viewed a roentgenogram of the patient's lung taken at the hospital immediately after the accident. This roentgenogram revealed the presence of a single-rooted tooth in the right bronchus. This tooth, obviously, had been inhaled by the patient unconsciously either during or immediately after the accident.

Only by bronchoscopic elimination of the tooth could a severe pulmonary complication be prevented.

Principles of resuscitation in the dental office

Max S. Sadove and Gordon M. Wyant. *J.A.D.A.* 53:168-174 Aug. 1956

Most accidents in the dental office are of a minor nature and will respond to the procedure of placing the patient into the supine position with legs elevated and administering oxygen.

Syncope (fainting) has as predisposing factors pain, surgical instrumentation, emotional disturbance and dehydration which may occur in hot weather. Syncope frequently is preceded by premonitory signs such as weakness, giddiness, faintness and profuse sweating. During this stage the patient is instructed to lower his head between his knees. A cold wet compress to the forehead is helpful. If consciousness is lost, the patient is placed in the recumbent position with the legs elevated, and oxygen is administered.

The next most important condition requiring resuscitation in the dental office consists of reactions to local anesthetics. Other conditions which may be the cause of accidents include incorrect sedation, cardiac involvements, diabetic or insulin coma, cerebrovascular conditions, hysteria, and epilepsy and other types of convulsions.

The primary need during resuscitation is to maintain the oxygen supply to vital organs. An adequate supply of oxygen to vital organs depends on the integrity of the respiratory and circulatory systems. If a catastrophe of the magnitude of cardiac arrest does arise in the office, the chances of salvaging the patient are small. Yet, the few maneuvers available to the dentist under these circumstances should be employed.

Much difficulty can be avoided by taking a good history and by obtaining medical clearance in doubtful cases.

Means must be available in every dental office for the basic requirements to maintain circulation and respiration. There must be available an oxygen tank with regulator, a mask, a breathing bag and a series of airways of different sizes. To support circulation there are needed syringes of 2, 5 and 10 cc. capacity with needles, together with a few drugs such as phenylephrine hydrochloride, hyaluronidase, thiopental sodium dextrose in water, secobarbital, atropine sulfate and aromatic spirits of ammonia. The dental office should be equipped with a chair which can quickly and easily be tilted into the horizontal position. A stethoscope and sphygmomanometer are advantageous if the dentist is trained to use them.

Preventive and public health dentistry

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Caries etiology and control

Is a new concept of the etiology of dental caries and periodontoclasia needed?

Herman Ausubel. *New York Univ.J.Den.* 14:75-78 Jan.; 118-123 April 1956

To date, the etiology of dental caries has yet to be discovered. Present prophylactic methods and oral hygiene are based on Miller's chemicoparasitic theory (1882). Miller's theory is that zymogenic bacteria act on carbohydrates deposited on the teeth, and by fermentation produce lactic acid which dissolves the calcium in the enamel, causing the enamel rods to fall apart. Saprophytic bacteria then liquefy the basic organic substance in the dentin, with the resultant production of cavities in the teeth. Miller's theory explains the chemical process of dental caries when it does occur but fails to explain why teeth do not decalcify all the time.

Followers of Miller should explain such observations as the following:

1. Why is dental caries generally absent in mouths affected by periodontal disease, and vice versa?
2. Why are the teeth of primitive peoples generally free from dental caries, though these people never clean their teeth?
3. Why do identical twins often show pronounced similarity in caries suceptibility and immunity?
4. Why is rampant caries found in persons enjoying excellent health who follow all the precepts of oral hygiene, whereas the teeth of persons who never use toothbrushes may be immune to caries?
5. Why does dental decay diminish as the person ages?
6. Why are some races more prone to dental caries than others?
7. Why are city people more prone to dental caries than country people?
8. Why are women more subject to dental caries than men, particularly during gestation and lactation?
9. Why does fluoride in drinking water cause a reduction in the incidence of dental caries?
10. Why are lower anterior teeth almost immune to dental caries?
11. Why are certain teeth attacked in preference to other teeth?
12. Why is caries more prevalent in certain forms of disease?
13. Why is there a mutual antagonism between the caries and calculus formation processes?

When the gingival margins of restorations are extended under the free margin of the gum, the tooth is less susceptible to secondary caries.

The Serres' glands, situated on the surface lining of the gingival crevices and in the periodontal membrane near the surfaces of the cementum of the roots of the teeth, are alive, active and functioning, although no special function has been observed for them. Perhaps the Serres' glands secrete a substance which provides a protective covering against liquefaction of the enamel of the teeth by the action of acidogenic bacteria.

The secretion of the Serres' glands should be identified chemically and tested to see if it is effective in preventing dental caries and periodontal disease.

The isolation and classification of lactobacillus strains from Italian saliva samples

A. C. Hayward and G. H. G. Davis. *Brit.D.J.* 101:43-46 July 17, 1956

The lactobacillus types found in the normal saliva of a group of Italian subjects were compared with those already recorded for American, Scandinavian and English saliva. Samples were collected in Rome and its environs in September 1955. Three hundred and sixty-eight strains of lactobacilli were isolated and classified. The occurrence and distribution of the various types of lactobacilli in the Italian saliva were generally similar to what had already been found in oral material from

other countries, although the correlation of a low incidence both of caries and of lactobacilli is of interest in the Italian study.

In Italy as elsewhere, *Lactobacillus casei, L. fermenti* and *L. acidophilus* appear to be the commonest oral species. No exceptional types were isolated.

Sixty-six saliva samples were examined, of which 19, or almost a third, were from mouths considered to be completely free from caries. Fourteen samples of saliva yielded no lactobacilli under the conditions of the experiment, of which seven were from caries-free mouths and seven from carious mouths.

Role of fluoride in the evolution of the teeth

(Papel del flúor en la evolución del diente)

P. Leon Luque. *Rev. A. odont. Argentina* 43:493-496 Nov. 1955

Tooth enamel is the tissue of the body which contains the greatest amount of fluoride. The hardness and resistance of the enamel are a result of the great amount of fluoride present in it. Fluoride is supplied to the body by a natural diet, whole wheat bread, and drinking water which naturally contains fluoride. The optimal level of fluoride in drinking water is 1 to 1.4 ppm. If present in a higher concentration, fluoride does not offer greater protection to the teeth but causes mottled enamel. A concentration lower than the optimal increases the incidence of dental caries and calls for artificial fluoridation of the water.

Fluoride protects the teeth against caries. It does not improve the carious lesions, however, nor does it delay their evolution. Fluoride acts by improving the mineralization of dental tissues and of teeth during the periods of their natural mineralization, which are the intrauterine life and childhood.

The substitution of fluoridation of drinking waters with fluoridation of table salt is not advisable. Fluoridated salt is not available for children and should not be given to certain pregnant women who are on a salt-free diet.

According to reports from the United States, the results of fluoridation of drinking water are satisfactory. Fluoride, given in the doses that are used in artificial fluoridation, is not toxic. Instances of "endemic fluoride intoxication" with symptoms of chronic fluoride intoxication which have been reported in the literature as having occurred in small communities of South Africa and Asia were caused by the combination of excess concentration of fluoride in the water (8 ppm) and excess drinking of water on the part of the people of those communities who were trying to quench their thirst. Fluoride produces no unpleasant effect in the systems of the body. The only exception is mottled enamel.

In Argentina, the drinking waters of 51, 64 and 48 per cent of the communities of Buenos Aires, Santa Fe and Cordoba, respectively, are poor in fluoride, whereas those of 27, 12 and 29 per cent have an excess concentration of fluoride. Measures are now being taken in Argentina for the fluoridation of drinking waters which are poor in fluoride.

Advances in dental caries research

Reidar F. Sognnaes. *Report Seventeenth Ross Pediat.Res.Conf.* p. 68-74, 1956

Dental caries is a disease that has been with man a long time. Some Neanderthal skulls exhibit the disease. Records from ancient Greece indicate that it existed 5,000 years ago. Until the time of Christ only about 10 per cent of persons were affected, but since that time the incidence has increased dramatically.

The saliva, the bacterial flora and food substrate of the oral cavity have been most extensively studied among factors leading to caries. Caries study in rats raised under germfree conditions presents evidence that the presence of a bacterial flora is one of the conditions essential to produce caries. In rats fed by stomach tube, caries does not develop despite the presence of microorganisms in the mouth; this fact indicates the equal importance of certain food substrates in the oral environment for the production of tooth decay. In littermate rats joined in parabiosis with a common circulation, caries develops only in animals receiving certain carbohydrates by mouth.

Removal of the major salivary glands greatly increases destruction of the teeth by caries, indicating that the salivary secretion is most protec-

tive to the teeth. Perhaps the most striking endocrine effect on caries is the remarkable preventive effect of castration.

Caries has not been observed in animals fed diets high in protein and fat and essentially devoid of carbohydrate. With this dietary regime teeth remain intact even if all the salivary glands are removed. There are indications that caries production depends on the form in which carbohydrates are ingested and the age at which the animals are first introduced to this dietary component.

The cariogenic action of the microorganisms and their substrates has been modified by various inhibitors. Among the antibiotics, it appears that those which predominantly act on gram-positive microorganisms have the greatest caries-preventive effect. There is evidence that in addition to fluoride, other trace elements and certain organic dietary constituents yet to be established are important in the development of highly caries-resistant teeth.

Animals appear to vary in their susceptibility to dental caries. The susceptibility seems to depend on hereditary background. The mechanism by which genetic factors act on tooth decay has yet to be established.

If it is assumed that this work in animals has a bearing on the problem in man, the cause of tooth decay in man must be a composite of genetic, developmental, salivary, endocrine, bacterial and dietary factors.

Effect of fluoridated public water supplies on dental caries prevalence

Francis A. Arnold, Jr., H. Trendley Dean, Philip Jay and John W. Knutson. *Pub.Health Rep.* 71:652-658 July 1956

As early as 1942 it was demonstrated that the use of fluoridated water produces a substantial reduction in the incidence of dental caries. These epidemiologic studies suggested that the addition of fluorides to public water supplies would result in a substantial reduction in dental caries. To test this hypothesis, several studies were begun in 1944, including one at Grand Rapids-Muskegon conducted by the Public Health Service in cooperation with the Michigan Department of Health. The findings from ten years of observation in that study are summarized. The results indicate that the adjustment of the fluoride content of a communal water to an optimal level (about 1 ppm fluoride) will produce the following effects:

1. A striking reduction in the prevalence of dental caries in the deciduous teeth. At the peak of prevalence, namely six years of age, the caries rate for the deciduous teeth was reduced by about 54 per cent.

2. A substantial reduction in the prevalence of dental caries in the permanent teeth. In children born since fluoridation was put into effect, the caries rate for the permanent teeth was reduced on the average by about 60 per cent.

3. Some benefit among persons whose teeth have already formed or erupted when fluoridation is begun.

4. No undesirable cosmetic effect from dental fluorosis.

Studies on the mottled teeth observed in the mountain area of the eastern part of Aichi prefecture

Yukichi Orihashi. *Odont., Tokyo* 43:65-69 Nov. 1955

Recently the occurrence of mottled teeth—the so-called "Aso volcano disease"—was reported in the mountain area of the eastern part of Aichi prefecture. In November 1954 the teeth of 206 men and women in the district were examined.

Mottled teeth were found in 42.37 per cent of those examined. Mottling was observed most frequently in the maxillary central incisors, the attack rate being 37.29 per cent. The attack rate of caries was 46.89 per cent.

A higher percentage of caries was found in those imbibing spring water than in those drinking river water.

The coefficient of correlation between mottled teeth and caries is -0.121; that is, no positive correlation was found but there may exist a negative one.

A later report will be presented on fluoride contained in the drinking water and its association with mottled teeth and caries.

A new dental caries control program

Philip Jay. *J. Michigan D.A.* 38:239-240 July-Aug. 1956

The dental caries research laboratory of the School of Dentistry of the University of Michigan has received a university grant permitting the laboratory to extend its services and to obtain clinical data in order to evaluate the effectiveness of low carbohydrate diets in reducing dental caries.

Data now available indicate that oral lactobacillus counts are being reduced in a significant proportion of patients who undertake the dietary treatment.

The dietary program includes three plans which are followed consecutively. Plan 1 restricts the daily carbohydrate intake to 100 Gm., with no free sugar. Plan 2 also restricts free sugar but permits starches in any amount to be taken. Plan 3 allows an unlimited amount of starch, and sugar with one meal a day. On the basis of several thousand cases, it has been determined that about 80 per cent of the patients successfully negotiate diet plans 1 and 2, and that about 73 per cent still have low lactobacillus counts after they have completed diet plan 3; of these, about 90 per cent no longer require dietary supervision for from six months to several years. Although the percentages are satisfactory, less than half of the patients complete the series. Most of the patients who fail do so because of lack of adequate dietary instruction. It requires about 45 minutes to instruct the patient properly.

Under the new program, it is planned to set up four centers in the lower peninsula and one in the upper peninsula where the university has extension offices. The nutritionist from the laboratory will visit these centers regularly to instruct patients. Appointments may be made by telephoning the university extension office. The dentist will be required to submit a dental caries record on a form provided by the extension office. Additional charts will be made out at yearly intervals so that the patient's progress can be evaluated by the dentist.

Patients should be selected on the basis of caries experience and ability to cooperate. This will limit the study to patients with severe dental caries activity who require help in its control. To be eligible the patient should show evidence of severe past caries experience and a lactobacillus count of 10,000 or higher. The initial counts will be made by the State Health Department. After the patient has received dietary instruction the additional counts will be made by the caries control laboratory in Ann Arbor.

Although the project will be financed largely through a research fund, the patient will be charged a token fee commensurate with those of the dental clinic. One of the objectives of this study is to determine the practicability of this method in private dental practice where a service fee would be an important consideration.

The effect on caries incidence of adding sodium citrate and sodium acetate to a cariogenic diet

Gösta Gustafson, Em. Stelling, Ernst Abramson and Edvard Brunius. *Odont. Tskr.* 63:524-530 Dec. 1955

The most accepted theory of the etiology of dental caries assumes that the formation of acids on the tooth surfaces is an important factor in the initiation of the carious lesion. Sodium citrate, fluorides, soluble oxalates and other compounds block the formation of acids from carbohydrates by inhibiting the enzymes concerned.

This study was carried out in an attempt to examine the effect of sodium citrate as an inhibitory agent.

A diet to which sodium citrate is added will differ in buffering capacity from a control diet without citrate. Sodium acetate was therefore added to the control diet to give the two diets the same buffering capacity. To study the effect on caries incidence of the buffering capacity, a third group was fed the basal cariogenic diet without any supplements.

After weaning, 107 animals were distributed on the three diets for 150 days after which they were sacrificed and the heads placed in 9 per cent solution of formaldehyde until the caries examination could be carried out. The animals on citrate diet showed substantially slower growth than those on the acetate diet and those on the

unsupplemented diet showed the best growth. The results of caries examination are given separately for males and females, since it appears that the males are more susceptible than the females. The caries incidence of the animals on the 4 per cent citrate diet was higher than for those on the acetate diet. The antienzymatic capacity of sodium citrate did not, as expected, result in a decreased caries incidence as compared with the incidence for animals on the same diet to which sodium acetate had been added to attain the same buffering capacity.

The caries incidence in the animals who were fed the two highly buffered diets was significantly lower than for those on the diet without buffering substances added. From this result it may be concluded that the buffering capacity of a cariogenic diet is of importance for its cariogenic effect. Further work is indicated to explain why the acetate diet is more caries inhibiting than the citrate diet.

High fluoride content of teeth from communities with low fluoride water supplies

James H. Shaw, Om P. Gupta and Margaret E. Meyer. *Am.J.Clin.Nutrit.* 4:246-253 May-June 1956

The striking difference between the high incidence of caries in the people of North America and the low incidence of caries in the people of India suggested the possible value of analytical evaluations of the teeth from representative groups of people in India and America. Initially, determinations of the fluoride content of the enamel and dentin have been made. Other analyses are to be conducted to determine what quantitative variations exist between teeth from these populations.

From 52 patients in a clinic in Delhi, India, 161 teeth were collected; 75 teeth were collected from 36 patients in a hospital dental clinic in Bombay; 58 teeth were collected from 35 patients in Boston. The place of residence during youth, the cause of tooth extraction and the type of tooth were recorded.

The 161 Delhi teeth had 18 carious surfaces; the 75 Bombay teeth, 10 carious surfaces; of the 58 Boston teeth, 32 had carious lesions. The enamel of the Indian teeth had a high surface gloss and translucency, whereas there was a dullness and opacity to the enamel of almost all the Boston teeth. A high percentage of the Indian teeth had a slight marbled effect resembling the less severe degrees of mottled enamel. Many of the Indian teeth had large and highly pigmented areas of calculus, caused by betel nut chewing, whereas the Boston teeth were largely free of such deposits. There was an impression that the roots of the Indian teeth were much more resistant to cutting with a jigsaw than roots of comparable size among the Boston teeth.

The enamel and dentin of the Delhi and Bombay teeth had a much higher fluoride content than would be expected in view of the low fluoride content of the water supplies in these communities. The fluoride values for the enamel and dentin of Boston teeth were in the same low range as has been reported for the teeth of individuals in other low fluoride communities in the temperate zone.

Only part of the difference in fluoride content between the teeth of Boston individuals and those of Delhi and Bombay can be explained by the probable higher water consumption among the Indian citizens. The remainder would appear to be due to an additional source of fluoride in the diet, with sea salt as a logical possibility, or to a higher rate of absorption and utilization of the ingested fluorides, or to some combination of these two factors.

The incidence of dental caries in adolescents with different occlusion

P. Adler, Debrecen, Hungary. *J.D.Res.* 35:344-349 June 1956

Although it is generally accepted that persons with maloccluding dentitions are more prone to dental decay than are those with perfect occlusion, no reliable data seem to exist correlating the arrangement and occlusion of the teeth with the incidence of dental caries.

The incidence of dental caries was examined in boys and girls 16 to 18 years old in five Hungarian cities, in relationship to occlusal condi-

tions. Individuals with malocclusion display higher CER (caries, extractions and restorations) indexes than do those with normal occlusion. "Covered bite," with normal intermaxillary molar and cuspid relationships, is associated with less decay than is normal occlusion. This is true to some degree for Class II, Division 2 malocclusion also, at least insofar as in this type of malocclusion decay is not more prevalent than in those with normal occlusion. This finding points to the role of hereditary factors in caries susceptibility. Dental decay is an important causative factor of malocclusion. About 20 per cent of all malocclusions apparently are caused by the early loss of carious permanent teeth.

Evaluation of laboratory tests for the estimation of caries activity

Marshall L. Snyder, Theodore Suher, Donald R. Porter, Cecil K. Claycomb and Margery K. Gardner. *J.D.Res.* 35:332-342 June 1956

Although several laboratory procedures which utilize saliva as the test material have been advocated for the estimation of caries activity, the accuracy of any of these methods in predicting qualitative or quantitative clinical change remains doubtful. Some of the tests were evaluated by means of frequent sampling of a group of children for the laboratory data and comparing the results with their clinical experience measured semiannually over a five year period.

Lactobacillus counts made on tomato juice peptone agar (pH 5.0) containing sodium azide as a selective inhibitor were comparable with respective counts on Rogosa's SL agar if the azide was present in a 1:20,000 concentration. No essential difference was observed between the rate of color or acid formation in either Snyder's test agar or Rogosa's SLA (modified) medium compared with the lactobacillus counts of respective specimens of saliva.

Children from the Washington State School for the Deaf were selected for the clinical study. The tabulation of the clinical findings for correlation with the laboratory data has not been completed.

A new method for morphopathologic analysis of dental caries (Un nuova ed importante metodo di analisi morfopatologica della carie dei denti umani)

A. Colasanti. *Minerva stomat.* 5:121-127 May-June 1956

The need for a quantitative expression of caries incidence has resulted in the introduction of various analytic methods.

At the anatomy department of the Dental Institute of the University of Rome, Italy, the morphogenetic and morphopathologic processes of dental caries were studied with a new method (introduced by the author). This method was termed "epimicrostereoscopy." It combines the advantages of roentgenography, microscopy and stereoscopy. Specially designed instruments produce clear and easy to evaluate stereograms which reveal by indirect light the different stages of caries development.

Epimicrostereoscopy, now for the first time presented to dental science and research, can be used also in studies on the control and prevention of caries because all macroscopic, microscopic and roentgenographic findings relative to caries incidence and the effect of caries preventives can be observed three-dimensionally.

There is, as yet, no universally accepted or preferred method for the classification of carious cavities. The utilization of epimicrostereoscopy will not only make such a classification possible but will also make the task of caries diagnosis and prognosis easier, and, therefore, will be an aid in prosthetic dentistry.

Chewing load and caries resistance

H. H. Neumann. *D.Mag.&Oral Topics* 73:81-84 June 1956

The abrupt appearance of dental caries in primitive human societies is not an isolated incidence but follows a uniform pattern, likely to be encountered in any ethnic group on adoption of a modern diet.

The observation of many human societies has revealed the closest interdependence between the chewing demands on the teeth and the caries in-

cidence. The concept of function in caries immunity is not in conflict with the carbohydrate fermentation theory. In caries the teeth are attacked by bacterial agents, the breakdown being the effect of fermentation processes, or of proteolysis or of a combination. The bacterial processes which initiate caries, however, appear to be subordinated to a variable state of dental immunity.

The functional concept of caries immunity found little acceptance in the past, partly because a merely detergent action of hard food seemed an unsatisfactory interpretation, as superficial cleanliness could be provided easier and better by other means. Furthermore, any possible influence of function on the enamel structure was then unacceptable.

A detergent action is not instrumental in producing caries immunity. Dental reaction to use and disuse, that is, the varying exposure to the pulsating load of chewing, is a primary factor in caries susceptibility, whereas the attacking agents, always present in the mouth, are subordinated in their importance to enamel resistance.

Practically, it is proposed to add to the current diet of Western societies some items with enough toughness and resistance to provide sufficient compression stress on the teeth. Certain types of bread, such as those able to produce oral health in some European communities—Hungary, southern Italy or Greece—may be the answer.

Prevention of dental decay by modifying oral physiology is feasible, although it requires reeducation of the public.

Preliminary report on the effect of complete mouth rehabilitation on oral lactobacilli counts

Irving L. Shklair, Harold R. Englander, Lawrence M. Stein and Robert G. Kesel.
J.A.D.A. 53:155-158 Aug. 1956

The presence of lactobacilli in saliva has been used widely as an index of dental caries activity. Caries-active subjects usually demonstrate lactobacilli counts of at least 10,000 colonies per milliliter of saliva, whereas persons who are not caries-active seldom exhibit counts above 2,000 colonies and often manifest zero counts.

The effect of complete mouth rehabilitation on oral lactobacilli was studied. Forty-four naval recruits, aged 17 to 21, at the Great Lakes Naval Training Center were utilized. All carious teeth were restored with silver amalgam and silicate cement, and necessary extractions were performed. Two fasting saliva samples were cultured for the presence of lactobacilli by the method of Jay and Arnold (1946) prior to the initiation of the clinical program and at biweekly intervals up to 15 weeks after rehabilitation. All patients had an extremely high number of carious teeth and elevated initial lactobacilli counts. The mean number of carious teeth per person was 15 with a range of 3 to 27. The average preoperative lactobacillus count was well over 100,000 colonies per milliliter of saliva.

Forty recruits who did not receive dental restorations were used as controls.

During the first week after complete mouth rehabilitation there was a precipitous drop of at least 76 per cent over the prerestoration lactobacilli counts. Sixty-nine per cent (27 of 39 patients) exhibited zero counts the first week after all carious lesions had been restored. Five incompletely rehabilitated patients showed reduced counts but to a lesser degree. The 40 control patients did not exhibit a reduction in lactobacilli counts.

The problem of caries resistance

(Zum Problem der Kariesresistenz)

Chr. Commerell. *Deut.zahnärztl.Zschr.* 10:1418-1420 Nov. 1, 1955

A relatively small number of persons has such a high degree of caries resistance that this disease cannot be produced in their teeth. It is not established whether heredity plays a part in caries resistance in man, although in animal experiments certain strains have proved to be caries resistant and others caries susceptible.

Recently published reports on examinations of the dental condition of children and juveniles, conducted in different countries, state almost unanimously that in instances in which the teeth

are covered by brown or black tartar, a higher degree of caries resistance has been observed.

To verify such statements, the health authorities of the cities of Hamburg and Altona, Germany, examined the teeth of 12,890 school children during the school term 1954–1955.

Eleven per cent of the children examined had brown or black incrustations on their teeth, usually localized on the anterior teeth labially and on the posterior teeth buccally. Three per cent of the children had a greenish secretion of calcareous matter near the roots of the teeth.

The caries frequency in children with brown or black tartar formation was from 10 to 23 per cent lower than that of average children. In those who had the greenish serumal tartar, however, the caries incidence was 19 per cent higher than in those without tartar formation.

Even though these results seem to indicate that a relationship between caries resistance and tartar formation, the explanation of that phenomenon and the definition of the chemical analysis of the observed dental calculus (which could be caused either by negligence in oral hygiene or by the presence of periodontal disease) has to be established by further examinations on a wider scale.

Milk consumption and dental caries
(Lait et carie dentaire)

R. Dubois-Prevost. *Rev.franç.odontostomat.* 6:693-701 June-July 1956

Milk given to preschool and school children must be pasteurized before distribution, or, at least, boiled before consumption.

Milk and milk products should be included in the diet of pregnant women. Cows' milk is an essential food for its perfect balance in mineral salts and for the 690 calories contained in each pint.

Pasteurization is defined as the process of heating every particle of milk to at least 143° F., and holding this temperature for at least 30 minutes.

Homogenized milk is produced by forcing the fluid through small openings in metal plates under high pressure, to break up the clusters of butterfat globules and to reduce their size. The butterfat remains evenly distributed throughout the milk.

Research on caries prevention, however, has revealed that excessive milk consumption parallels an increase in caries frequency. Milk becomes easily contaminated with microorganisms, some pathogenic to man. These bacteria, despite pasteurization or homogenization, are added to microorganisms already present in the oral flora.

An adequate oral hygiene may counteract the cariogenic effects of these microorganisms; therefore, child patients should be advised to rinse their mouths with fluoridated water after consumption of milk or milk products.

Acid resistant substance in arrested carious lesions

Per Torell. *Odont.Tskr.* 63:495-599 Dec. 1955

Several authors have reported that the tooth substance present in arrested carious lesions is more resistant to acids than is intact enamel. In a previous report this author has assumed that this increased acid resistance may be part of a natural defense mechanism.

Through many clinical observations it has been established that rampant dental caries does not present any discolored lesions, whereas slowly progressing, chronic or arrested caries is characterized by brownish or blackish colored lesions. When the caries activating factors are eliminated in persons with rapidly progressing caries, a discoloration and hardening of the carious lesions appear.

The material for this study was limited to lesions with hard and unbroken surfaces which, after drying for 15 minutes, still had a shiny appearance. Such lesions most often appear just below the contact area on proximal surfaces of teeth which have been erupted for more than five years. One hundred and ten preparations were made of teeth with such discolored lesions. Pieces containing the discolored spots with about 2 mm. of intact enamel surrounding the spot were cut out from the teeth and placed in 2 per cent citric acid for from 5 to 11 days.

As control material, 50 preparations were made of teeth containing lesions of a more rampant character. These lesions were not discolored, had unbroken but soft surfaces and appeared dull

after drying. They were prepared from teeth extracted from children 11 to 12 years old. They were given the same acid treatment as the discolored specimens. In the 110 preparations with discolored spots the intact enamel had been destroyed and had a muddy appearance. After drying it appeared as a fine powder. The discolored enamel seemed unaffected by the acid and could be picked up from the powderish remnants of the enamel as a hard cone-shaped cake. After acid treatment of the 50 specimens with more rampant caries without discoloration, no difference was noted between carious and intact parts; both were totally destroyed.

The substance present in carious lesions of the arrested type thus shows an increased acid resistance, not found in progressive dental caries. This indicates that if certain caries activating factors are eliminated, biochemical reactions causing destruction of the enamel may be replaced by reactions giving the enamel an increased acid resistance. This is believed to be the result of a remineralizing and reproteinizing defense mechanism.

Refined sugar: its relation to dental caries

Robert J. Fanning. *Mil.Med.* 118:508-513
May 1956

Dental caries can be controlled by decreasing the forces which tend to cause caries or by increasing the resistance of the tooth to the attacking forces. The reduction of carbohydrates in the diet may decrease the attacking forces, whereas the topical application of fluoride solution to the teeth may increase tooth resistance.

In general, there are two schools of thought regarding the initiation of caries. There are some who believe that local factors are entirely, or chiefly, responsible. The other view is that whereas caries is a local action and always begins at the exterior of the tooth, it is the structure of the tooth which determines whether or not decay will occur.

The University of Michigan has devised a plan whereby caries can be controlled materially by the patient, either by avoiding foods, confections or beverages containing sugar or by going on a restricted carbohydrate diet for about seven weeks.

No patient should be placed on a restricted diet unless he is intelligent enough to cooperate, is willing to adhere to the diet, and unless a lactobacillus count is done beforehand to determine whether such a diet is indicated. When patients have observed a restricted carbohydrate dietary regimen, a reduction in the lactobacillus counts and in the number of cavities may be expected.

Although the reduction in refined sugars and carbohydrates is strongly recommended and although it may be concluded that dental caries virtually can be eliminated by this procedure, other contributing factors, such as heredity, cannot be dismissed entirely.

Fluoridation of water

Editorial. *Brit.M.J.* No. 4979:1348-1349
June 9, 1956

The fluoridation of public water supplies has recently begun in Kilmarnock, Anglesey and Watford, and is expected to begin soon in Andover. These "controlled demonstrations" have been undertaken in fulfillment of a recommendation made by the United Kingdom Mission on fluoridation that visited North America in 1952. The intention of these demonstrations, according to the Ministry of Health, is "to measure the extent of the benefit derived in this country so as to be able later on to judge whether the process should be applied more widely." Other areas are to serve as controls.

One reason why a cautious trial of the process is desirable is that some members of the community, including some medical men, are opposed on various grounds to the introduction of fluoridation, or are not convinced that it is the best way to diminish dental caries, or question whether its safety has been determined with sufficient certainty. Controversy on the subject is not confined to the lunatic fringe.

The Ministry of Health recently again sought the views of the Medical Research Council on the possibility that fluoridation might be harmful;

after receiving the Council's advice the Ministry issued a statement "that there is no evidence warranting alteration or abandonment of the fluoridation projects. . . . There is no definite evidence that the continued consumption of fluorides in water at a level of about 1 part per million in drinking water is in any way harmful to health." The Council's advice to go on with the projects will command respect and is reassuring.

Perhaps the most urgent need at present is to direct the necessarily limited resources of research to elucidating not so much the effects of fluoridation as the causes of caries. Fluoridation is unlikely to be the last word on the subject; its mode of action is unknown, and other measures, such as alteration in diet and the regular use of the toothbrush, may prove to be more efficacious.

▼ Miscellaneous

Dental calculus disposition and the institutional environment

S. MacNeill. *Irish D.Rev.* 1:81-85
Spring 1956

Whereas the comparatively low incidence of dental caries in children living in institutions has often received comment, scant attention has been given to the prevalence of dental calculus among such children.

A limited investigation was undertaken, with the concurrence of the Dental Board. In one home for girls and boys housing 226 children between the ages of four and ten years, 121 children, or 53.5 per cent, exhibited dental calculus. In a home housing 116 boys in the same age group, 49 boys, or 42.2 per cent, exhibited dental calculus.

In an institution for girls, 8 of a class of 10 in the 15 year old age group showed heavy deposits; in another institution, 4 of 6 examined in the 13 year old age groups had such deposits, as did 3 of 5 in the 11 year group. No pronounced calculus deposits, however, were found among girls in a city orphanage run by a different order of nuns than those in charge of the institutions for girls previously referred to.

A possible etiologic factor responsible for the calculus might be the intake of protein in the form of highly cooked meat.

Betel chewing in India
(Pan–des Inders Kaugummi)

Walther Müller, Zurich. *Deut.Zahnärztebl.*
10:515-516 July 8, 1956

The terms betel and pan are applied to two different plants. The betel nut is the fruit of the betel palm, and the betel leaf (pan) is the vine of the betel pepper.

Both plants are cultivated only to obtain these chewing materials. Betel chewing is so widespread among the oriental people that it is estimated that one tenth of the earth's population indulges in this habit.

Chewing of betel and pan causes a copious flow of brick-red saliva which dyes the mouth, lips and gingiva. Extensive chewing, especially of pan, blackens the teeth.

Chewing of betel produces a stronger salivation and has a tranquilizing effect. It is said that it increases the digestive function.

Usually, a small piece of the betel nut is wrapped in a leaf of the betel pepper. Sometimes, cardamon, tumeric and other aromatics are added.

Silicate, carbonate or phosphate of lime, often applied to pan, are important factors in bone growth in a population which suffers from acute malnutrition. It has been reported that betel chewing serves as a preventive to dental caries and periodontal disease. Although these reports have not been verified, dental caries and periodontal disease are less frequent in betel chewing countries than in Europe and America.

Betel chewing also adds several vitamins to a usually inadequate diet.

In pan, the same stimulating properties exist as in coffee and tea. There are also the same quality differences. First-class pan is expensive and beyond the means of the lower classes.

Doctoral and Masters' dissertations

▼

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

Electromyographic study of head position. *Ralph Halbert. 1956.* M.S. *University of Illinois.*

Integration of certain variants as a determinant of facial morphology. *Alvaro Rubem Marcondes. 1956* M.S. *University of Illinois.*

Biologic characteristics of human gingiva in two age groups. *Amarjit Singh Marwah. 1956.* M.S. *University of Illinois.*

Fractures of jaws; diagnosis and treatment. *Rodney W. Leemkuil. 1956.* M.S. *State University of Iowa.*

A longitudinal cephalometric roentgenographic analysis of the occlusal plane in children, ages 8, 9½ and 11 years. *Morris Leventhal. 1956.* M.S. *State University of Iowa.*

Impacted mandibular molars; classification and removal. *Richard Lindenmeyer. 1956.* M.S. *State University of Iowa.*

A study in caries experience in college students with good occlusion and malocclusion. *Philip J. Maschka. 1956.* M.S. *State University of Iowa.*

A photoelastic analysis of the stresses developed in a restored primary tooth when subject to forces of mastication. *David Bernard Mahler. 1956.* PH.D. *University of Michigan.*

A serial cephalometric study of the effects of orthodontic treatment on incisal overbite and the soft tissue profile. *Charles W. Hasstedt. 1956.* M.S. *University of Washington.*

A cephalometric and photographic appraisal of the dentofacial pattern of a group of Seattle Seafair princesses. *Wayne L. Peay. 1956.* M.S. *University of Washington.*

An investigation of the presence or absence of nerves in dentin. *Robert Rapp. 1956.* M.S. *University of Michigan.*

Growth changes in skulls of ancient man in North America. An x-ray cephalometric investigation of some cranial and facial changes during growth in the Indian Knoll skeletons. *Karl V. Sarnas. 1955.* M.S. *University of Rochester.*

Development of a methodology for cephalometric and clinical evaluation of Class I and Class II discrepancy cases treated by serial extraction procedures. *James Francis Bardgett. 1956.* M.S.D. *Saint Louis University.*

A cephalometric analysis of the stability and type of movement obtained in Class II, division 1 malocclusions treated with extra-oral forces. *Frank Bernardi. 1956.* M.S.D. *Saint Louis University.*

Treatment of Class II, division 1 occlusions with the extraction of the permanent maxillary second molars by using different types of therapy. *Wheeler Dale Frost. 1956.* M.S.D. *Saint Louis University.*

Histochemical studies on long bone and dentin of tryptophane deficient and tryptophane repleted rats. *Clarence David Honig. 1955.* M.S. *University of Southern California.*

A cephalometric study of a condition of artificial deformation simulating basilar impression employing osteological material. *Paul Wesley Johnson. 1955.* M.D.S. *University of Southern California.*

The effect of cortisone injections on the growth and development of the bone, teeth and periodontium in the rat. *Emmett Wesley Richardson, Jr. 1955.* M.S. *University of Southern California.*

A study of the effect of the thyroid malfunction on growth and development as it relates to orthodontics. *Donald L. Snedaker. 1955.* M.S. *University of Southern California.*

Predicting the mesiodistal crown width of unerupted maxillary canine, first and second premolars. *James Edward Brown. 1955.* M.S. *University of Tennessee.*

The relationship of the positions of incisor teeth to their supporting structures in superior occlusion cases as revealed by planimetry. *Robert Moody Williams. 1955.* M.S. *University of Tennessee.*

A survey of some commercial adhesives: Their possible application in clinical orthodontics. *John Franklin Sadler. 1956.* M.S. *University of Tennessee.*

Some practical psychological considerations in orthodontic practice. *George William Huckaba. 1956.* M.S. *University of Tennessee.*

A serial cephalometric study of the eruption of certain teeth and of the behavior of the mandibular condyle during growth. *Roland M. Davis. 1956.* M.S. *University of Washington.*

The application of three-dimensional photo elastic stress analysis in the analysis of orthodontic forces. *Russell P. Esposito. 1956.* M.S. *University of Washington.*

Study of the soft palate. *Robert E. Foster. 1956.* M.S. *University of Washington.*

Statistical analysis of incidence of internal disease cures after elimination of dental foci (Statistische Untersuchungen über die Ausheilung von inneren Krankheiten nach Sanierung dentaler Herde). *Karl Schindler. 1953.* DR.MED.DENT. *University of Freiburg/Breisgau, Germany.*

Increase in successful apicoectomies: compiled data (Über die Erhöhung der Erfolgssicherheit bei Wurzelspitzenresektionen: eigene statistische Angaben). *Emil Bichweiler. 1953.* DR.MED.DENT. *University of Freiburg/Breisgau, Germany.*

Experimental examinations of the thermal expansion occurring in self-curing acrylic resin, cementum, enamel, dentin and bones (Experimentelle Untersuchungen über die thermische Expansion schnellhärtender Kunststoffe, Zemente, Schmelz, Dentin und Knochen). *Günter Wulff. 1954.* DR. MED.DENT. *University of Kiel, Germany.*

The position of dental germs of permanent incisors during the attritional period of the deciduous dentition (Die Keimlage der bleibenden Schneidezähne in der Nutzungsperiode des Milchgebisses). *Rudi Kruse. 1954.* DR.MED.DENT *University of Kiel, Germany.*

Experimental studies and clinical observation with the self-curing synthetic dental plastic material "Sevriton" (Experimentelle Untersuchungen und klinische Beobachtungen über den schnellhärtenden Kunststoff "Sevriton"). *Harald Hagemann. 1953.* DR.MED.DENT. *University of Mainz, Germany.*

Treatment of gingivitis with the sodium chloride pastes "Selgin" and "Worcester" (Beitrag zur Gingivitisbehandlung mit den Salzpasten "Selgin" und "Worcester"). *Bruno Büchel. 1953.* DR.MED. DENT. *University of Mainz, Germany.*

Statistical examinations of the value of chemotherapeutics and antibiotics in postoperative diseases (Statistische Untersuchungen über den Wert der Chemotherapeutica und Antibiotica bei chirurgischen Erkrankungen). *Manfred Hofmann. 1955.* DR.MED.DENT. *University of Tübingen, Germany.*

Clinical experiences with dioxyphenylhexane–mucasept–in root canal treatment (Klinische Erfahrungen mit Dioxyphenylhexan–Mucasept–bei der Wurzelbehandlung). *Friedhelm Berg. 1955.* DR.MED.DENT. *University of Tübingen, Germany.*

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